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CROW RESERVATION COMPREHENSIVE PLAN

CONCEPTS AND LAND USE

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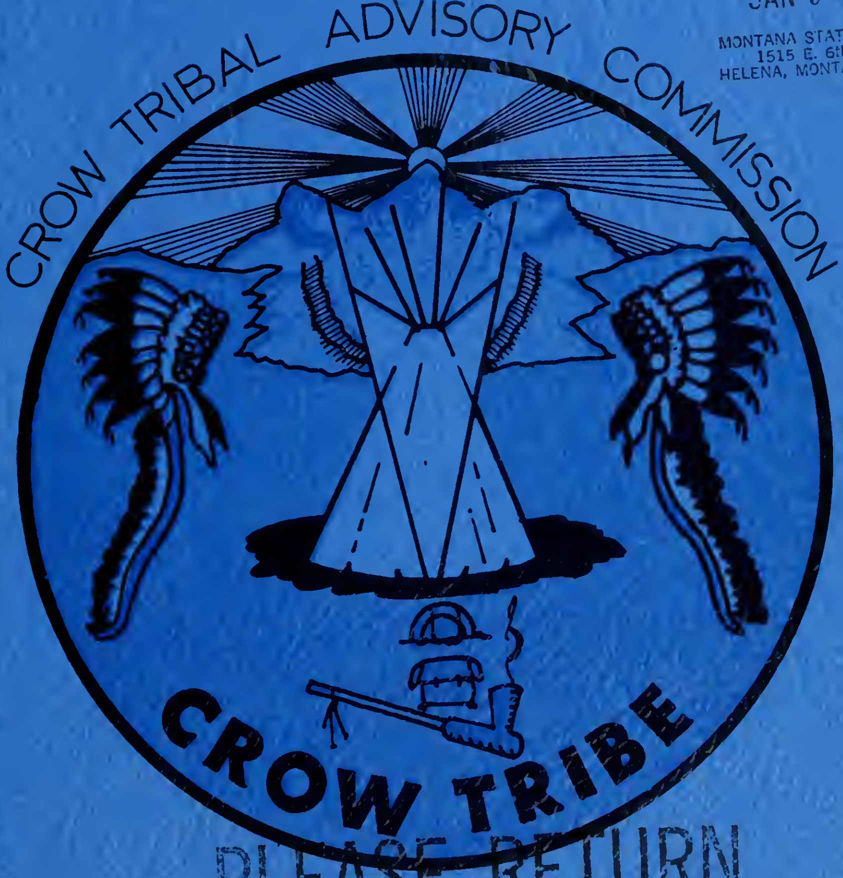

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CROW RESERVATION COMPREHENSIVE PLAN

BOOK 4

CONCEPTS AND LAND USE

This document completed as a portion of Comprehensive Planning Project P 45 D 2 under contract with the Montana Department of Planning and Economic Development and the Crow Tribal Advisory Commission of the Crow Tribe of Indians of Montana The preparation of this document was financed in part through an Urban Planning Grant from the Department of Housing and Urban Development under the provisions of Section 701 of the Housing Act of 1954, as amended

harrison g. fagg & associates crow tribal advisory commission

BOOK IV

CONCEPTS AND LAND USE

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INTRODUCTION

In conformance with action of the Crow Tribal Council, the Crow Tribal Advisory Commission was established for the purpose of developing a comprehensive plan relating to tribal resources and the management of all facets of reservation resources. Congress has not, to date, enacted enabling legislation to allow tribal governments to legally zone their reservations. Although some tribes have zoned all or part of their reservations, the trust status of the land and the lack of Congressional authority, leaves some question as to the legality of the ordinances.

The Crow Tribe has only adopted Montana statutes as they apply to marriage and divorce, compulsory education, and health standards. Without Congressional authority to zone, the only alternative open to the tribe is the adoption of state laws as they pertain to land use planning. For the purposes of this comprehensive plan, reservation adoption of the recent county planning district statutes enacted by the Montana Legislature would be applicable and satisfactory.

This Future Land Use Element is an essential portion of the Crow Reservation's comprehensive plan in that it constitutes a major recommendation to the Crow Tribal Council and other governmental bodies having jurisdiction within the planning area. By following appropriate legal procedures, this Future Land Use Element will be recommended for adoption as official policy of the governing agencies.

The purpose of this element is to promote orderly growth of the reservation and its economic and physical well-being by recommending intelligent utilization of land resources. It seeks to serve reservation residents, as well as those of surrounding areas, by providing the tools to shape the environment. Results should include provision of safe and enjoyable living areas, as well as space for working and leisure activity. The plan can also serve as a working guide for elected local government officials in making specific plans related to reservation development. As result of this plan, the public is presented with a continuing guide to land use development within the reservation area.

The future land use element is long-range, as it looks to the reservation's development over the next twenty-five years. It is comprehensive, taking into consideration an overview of the total environmental situation on the reservation. It is also general, providing flexibility in showing the general location and characteristic standards of major physical elements and significant relationships between each element on the reservation.

A principal basis for this future land use element centers on an analysis of past and present local conditions and opportunities. It is the result of a year of thoughtful study involving the entire reservation. The plan considers population, economic conditions, natural and man-made physical features, existing activities, and patterns of development, and potentials of the reservation situation. Several alternative sketch plan concepts were reviewed from which a final one was selected. This future land use element projects the probable development and future land use needs for residential, commercial and industrial activities as well as identifying land requirements for extended community facilities, especially, schools, parks, and open space. It specifies land for productive and conservation use. Previously prepared plans and existing conditions are reflected in proposals to achieve the goal of environmental improvement.

This Future Land Use Element expresses a land use plan for the Crow Reservation. Findings of principal previous plan elements incorporated in this report are: (1) basic physical data studies; (2) economic base studies; (3) population studies; (4) ecological survey; (5) concept studies and discussion plans.

Areas throughout the nation are becoming increasingly aware of the need for planning in relation to future growth. This concerns not only the need for more and improved public works facilities, community facilities, transportation systems, and government services, but also the need for integrating these growth facets into an overall plan for the future. This plan should serve to bring about the proper use of reservation lands in an orderly, efficient, economical, and realistic manner.

The Crow Reservation is constantly changing in a number of ways. Changes due to natural processes create new needs to be met. If the reservation does not plan for orderly change, growth problems will conflict with the area's good qualities. As reservation communities grow larger, portions of them will become obsolete and should be rebuilt. Continuous changes in the social and economic structure of the reservation including its population composition and the nature of occupations in which people participate will require alteration of the reservation's physical structure. Resource areas need to be intelligently used as well as preserved for future use. All of these influences tend to bring about new and different demands on services provided within the various reservation communities.

There are a number of objectives to be achieved through this future land use plan. The broad objectives of the future land use plan for the Crow Reservation are:

1. To guide future physical development of the Crow Reservation to achieve a healthy, functional, efficient, interesting, and attractive environment for its residents;
2. To assure that reservation wide interests are served by public development policies through consideration of relationships between public decisions and the economic, social and physical welfare of the entire reservation;
3. To realize long term benefits from the use of reservation physical resources, there must be realistic controls upon their utilization;
4. To facilitate the democratic process in determination and implementation of reservation development policies. Acceptance of responsibility for adoption of such policies by the Tribal Council should be made including opportunity for active citizen participation;
5. To bring continuing technical expertise to bear on public development policy decisions and to effectuate their coordination by referral of such development matters on the Crow Reservation to the Crow Tribal Advisory Commission for recommendations;
6. To insure that long-range considerations and priorities are recognized when making short-range development decisions;
7. To provide for intergovernmental resolution of reservation development problems, thus providing a basis for mutual determination of appropriate action courses between units and agencies of government.

In order to realize effectuation of the foregoing, the Crow Tribal Advisory Commission should recommend establishment of an appropriate legal basis and subsequent adoption of the Future Land Use Plan by the Crow Tribal Council and recognition of the plan by other appropriate governmental bodies.

The Crow Reservation, like other growing areas, needs to effectively plan for future land use within its boundaries. As urbanization is rapidly occurring outside the reservation in Hardin, Billings, and Sheridan, the Crow Reservation also needs to recognize development adjacent to its periphery.

The basic justification for development of this plan is derived from tribal government's preoccupation with protection and promotion of the public interest. In planning matters, any attempt to weaken or override the pre-eminent role of the public interest must be resisted. Moreover, any attempt to remove responsibility of interpretation of the public interest from elected, duly designated, public officials must likewise be resisted. Determination and expression of the public interest in the development of a future land use plan is the responsibility of local government. This is in keeping with the concept of democratic government within which the Crow Reservation operates. The public interest is best served by a future land use plan which recommends the best use of land on the reservation, recognizing the diversity of influencing factors which make it so. It is for this purpose that the land use element was initiated.

Development of base data and its analysis lead to the preparation of this land use element report and the Future Land Use Plan it contains. The Future Land Use Plan Concept for the Crow Reservation includes recommendations derived through the comprehensive planning efforts of the Crow Tribal Advisory Commisssion and the planning consultants to date. Detailed discussions and proposals are contained in the following section on Future Land Use Needs and are represented graphically on a Future Land Use Plan map. The principal conceptual components of the plan are simply identified as:

1. Existing townsite growth on the reservation will be concentrated in Crow Agency and Lodge Grass. A new town should be established to serve potential workers in the coal extraction and production area near the northeast border of the reservation, and a second near the present Fort Smith townsite to house recreation industry workers. Some low density vacation house development will be provided for near Fort Smith. Most of the townsites on the reservation are expected to remain essentially stable in population and each townsite will contain areas for housing, industry, commerce, public and semi-public activities for its residents, as well as services and functions for the nearby rural reisdents.

2. Major thoroughfare access is to be provided between each reservation townsite and economically significant development areas. The internal circulation system is to be linked to major routes connecting the reservation to nearby cities. A minimum lineage of thoroughfare development to achieve this objective is desired. Rail and air facilities are proposed to meet increased local needs.
3. Four large major recreation areas are identified as related to the reservation's recreation development potential and physical resources.
4. Farming areas are identified and the plan reflects the need for increased irrigation of productive lands.
5. Natural resource production areas are identified to reflect the locational extent of specific resources. Predominant land use potential is identified for oil and gas production, coal resource development, and forest resource production. Management and reclamation practices are described for each as should be required.
6. Special preservation areas are proposed to accommodate low areas subject to flooding and higher elevation areas and mountains.
7. Grazing land and rural open space remain the dominant land use throughout the planning forecast period. These areas should be subject to adequate soil and range management practices.

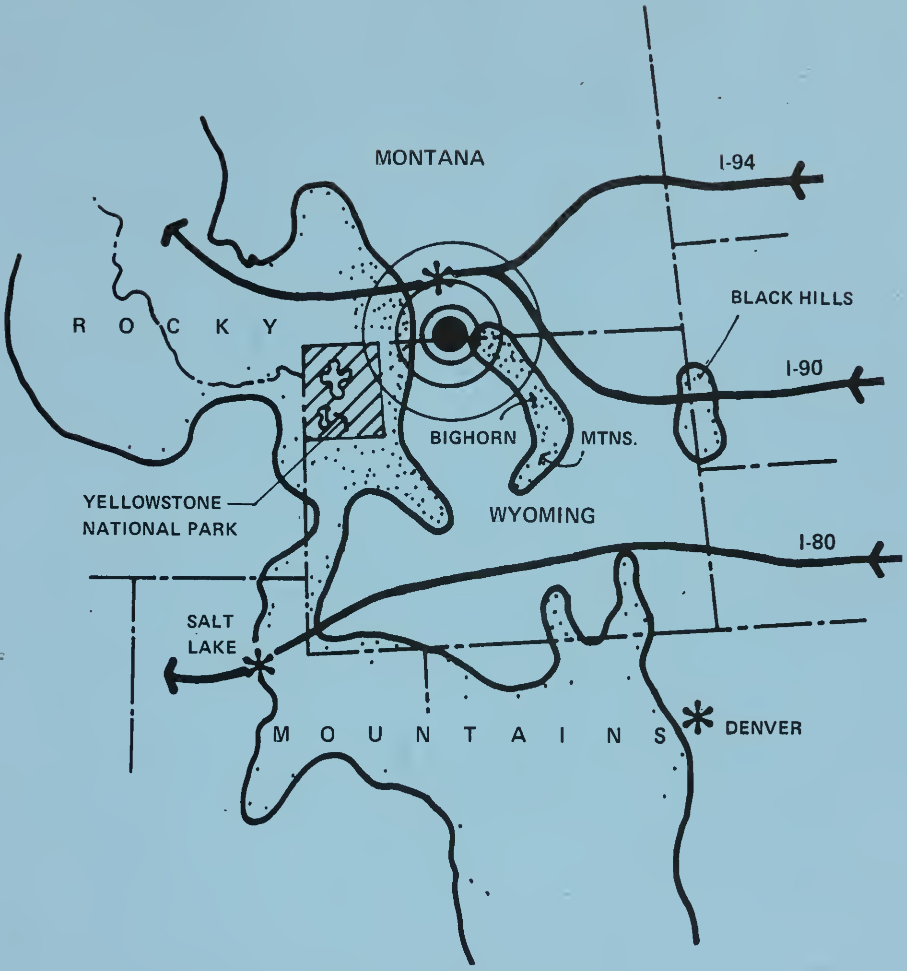
Land use as described in the following Future Land Use Plan are expressed in terms of future land use needs, a future land use map, future land use policy statements, and a coordinated future land use plan implementation system. These recommendations, of course, are general guidelines to reservation land development. Physically some use areas overlap as is defined in the map and tabular data presented. Quantities expressed for an area as large as the Crow Reservation and must be general in nature, due to their integral complexity. They are sufficiently accurate, however, to serve the needs of general reservation planning.

CONCEPT SKETCH PLAN ALTERNATIVE

As a basis for discussion and development of a plan for the Crow Reservation, three alternative sketch plans were developed which approached utilization of the reservation lands in different ways. The sketch plans were based on accumulated data derived from the basic planning studies and reflect the goals and objectives established by the Crow Tribe. These alternatives provide for different circulation systems that accomplish the basic internal circulation objectives of the Reservation. Each identifies a different approach to living and working areas for the residents. Each of the three alternatives provides differently for potential recreation development on the reservation. In establishing the alternatives, a number of significant influencing factors were considered. These include the existing human resources, the physiography of the reservation, the location of natural resources, natural drainage systems, existing living and working areas, presently developed major streets and those which are programmed for future development, existing principal recreational resources including the Yellowtail Dam and Reservoir, land suitable for irrigated farming, and many other factors.

Some of the influences considered are fixed constants which appear in all concept plans. Included in the fixed considerations are lands with high elevations (above 5,000 feet), flood plain areas along major streams, mineral resources, location of coal resources, existing railroad lines, present town sites, location of oil fields, and the Crow Agency Industrial Park. Principal variables considered in concept development include the configuration of major roads to achieve satisfactory, and the size and location of primary recreation areas and town site growth policy alternatives.

The Crow Reservation's oil and gas resource production areas are located on Ash and Soap Creeks in the vicinity of Hardin and east of Lodge Grass. Oil exploration, as was documented in the Natural Resources Section, has been undertaken in other reservation areas. The location of existing production areas are identified on the sketch plans. In a generally open rural environment, oil and gas production activity is not a particularly undesirable land use activity. Land used for oil and gas production can only occur where the resource exists, therefore, only known locations are identified.


MONTANA
I-94
BLACK HILLS
R O C K Y
I-90
BIGHORN
MTNS.
YELLOWSTONE NATIONAL PARK
WYOMING
I-80
SALT LAKE
M O U N T A I N S
DENVER

location

The potential resource development and reclamation area of coal deposits are located in a band along the eastern border of the reservation averaging fifteen miles in width. This land area is underlain by sub-bituminous and lignite coal compatible to strip mining practices. However, it is a basic tenant of present planning that strict reclamation practices should be an essential part of any utilization of this resource. In the past, strip mining without reclamation has a very detrimental effect upon the landscape. By combining resource production with reclamation, the most undesirable characteristics of this form of extraction can be overcome. Subsequently, detailed procedures for accomplishing reclamation must be identified.

Three of the five forest resource production and management areas on the Crow Reservation are in mountainous areas. As documented in the Population and Economic Study, these forest resources are of varying qualities and quantities. Because of distances, they are often difficult to utilize. Any development of this resource will require very careful timber management in order to realize sustained timber yield. Like utilization of the coal resource, commercial production of the reservation's timber resource should not in any way spoil the environment. Rather, through effective management of this resource, the reservation should look forward to actual improvement of its timbered areas.

Dry farming areas on the Crow Reservation are designated upon existing dry farming patterns. In addition, the Concept Plans show general areas in which dry farming can occur as a predominant land use. Other areas can be brought under cultivation if economic conditions warrant. This would, in no way, be an undesirable deviation from the sketch plan. Identification of areas for dry farming on the sketch plans are primarily a locational one which would be subject to limited, if any, control.

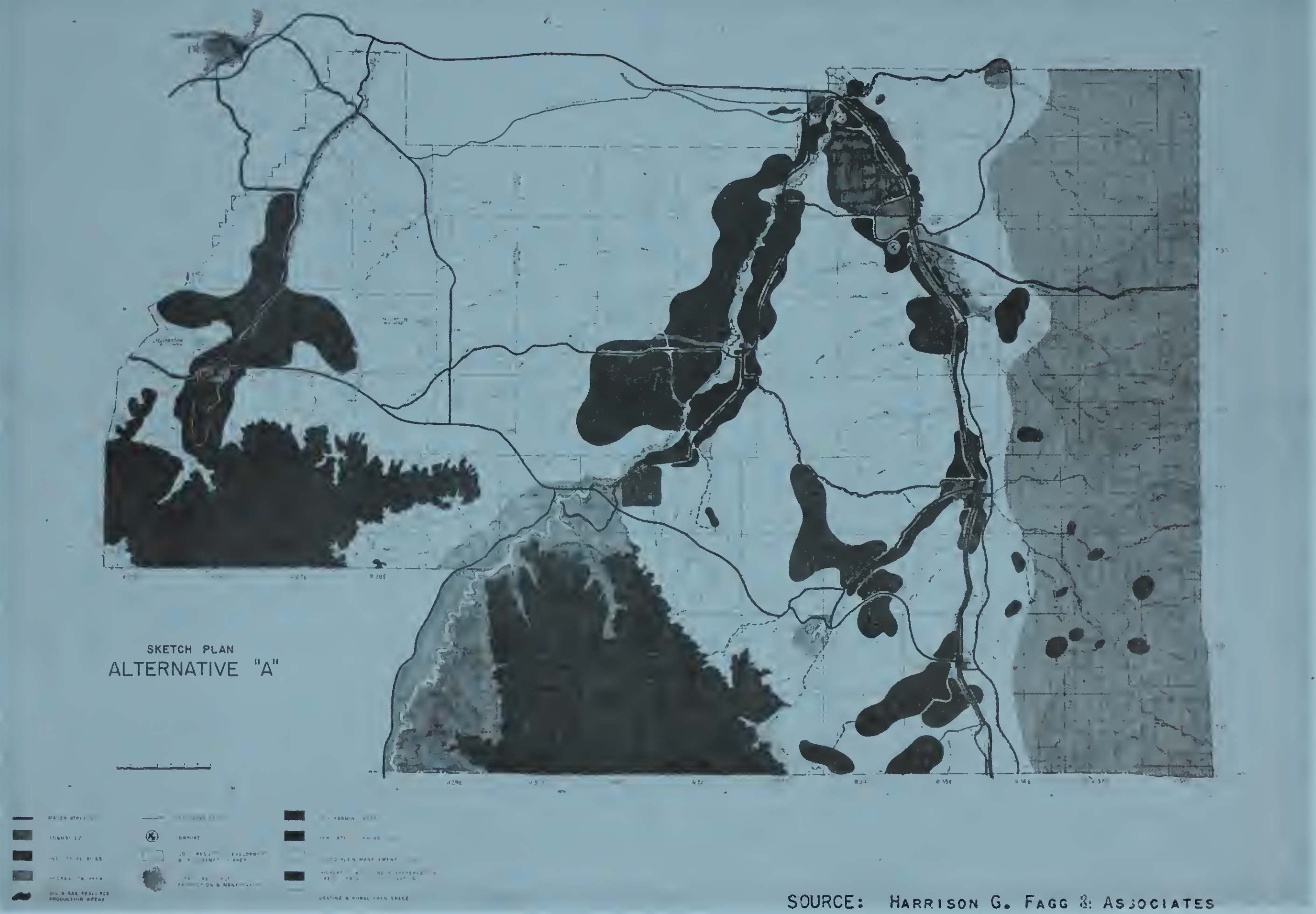
Irrigated farming areas portrayed in the Concept Plans show the effect on farming patterns along the Big Horn River, if a very large amount of land, west of the river, can be brought under irrigation through the realization of the Hardin unit proposal. The plan also shows the location of present irrigated farming areas which center on alluvial lands of the major drainage basin. If the reservation is to achieve increased revenues through agriculture, irrigated farming will be one of the principal ingredients of the increase. The Concept Plans reflect the economic potential of irrigation by designating significant land areas for this important purpose.

Land utilization, as designated in the Concept Plans, is concerned with flood plain management areas. Along the Big Horn and Little Big Horn Rivers, are certain areas subject to periodic flooding due to topography combined with the action of time and water. As a general rule, flood plain areas should not be inhabited, and future construction designed for human habitation should be discouraged in these areas. Relocation of the reservation towns lying in the flood plains seems to be unrealistic. One of the alternatives considers growth in Crow Agency only, and retardation of growth in the other communities. (Retardation being defined as limiting development to the present townsite area). Since flood plain areas are particularly well suited to recreation and agricultural uses, controls should be established in these areas limiting activity to these uses. Crow Agency would therefore be a perfect area for growth, since it is a community which could grow to the west outside the flood plain.

On the other end of the Crow Reservation topographic spectrum, wilderness preservation areas are provided. The basic concept of this sketch plan element is to maintain the mountainous portions of the Crow Reservation in their natural state. The mountains are a significant identifying characteristic of the reservation, and they contribute greatly to the scenic beauty of the area for aesthetic and recreation purposes. The Indian population tends to identify strongly with these relatively unused areas. Preservation of high lands over 5,000 feet in elevation would include development restrictions, limiation of road development, agricultural activity limiations, control of timber production in higher elevations, and other desired use limitations.

Each of the sketch plans contains areas designated for each of the specified uses. Each three different sketch plans include the same oil and gas resource production areas, coal resource development and reclamation areas, forest resource production and management areas, dry farming areas, irrigated farming areas, flood plain management areas, and highland wilderness preservation areas. Considerable variation exists between the three alternatives in thoroughfare and access road locations, townsites, industrial sites, recreation sites, railroads, and airports. First and foremost, each of the alternatives is designed to accommodate the economic potential of the Crow Reservation as identified in the Population and Economic Study. Accordingly, each concept sketch plan designates areas for recreation, minerals extraction, manufacturing, and agriculture. The extent of each use area is the essence of the difference between the plans, although considerable differences also exist in the street systems employed. It is the consultant's opinion that alternative C presents a reasonably usable and achievable interrelationship of uses, activities, and circulation for the Crow Reservation. Each of the alternatives, however, has unique characteristics which may be considered as more desirable for some reason or another.

Alternative Sketch Plan A provides for physical, population and economic growth in each of the reservation towns. It designates a site for a new town to house the activities and workers of the future coal mining industry and proposed gasification plant, and a new town development for the recreation and related industries workers near Fort Smith. The Fort Smith location is also considered for development of second home or vacation home sites. This alternative features a circulation system that vastly improves the directness of routes between reservation towns. Some of the routes selected are new and others envision improvement of existing alignments. In alternative A each of the towns would grow a little. Industrial sites are designated for Pryor, Lodge Grass, Crow Agency, and at the new mining town site in order to provide jobs where the people live. Similarly, lands designated for recreation development are shown at Pryor (including the Chief Plenty Coups State Park), Yellowtail Dam and Big Horn Canyon National Monuments near Crow Agency. The Pryor site is a relatively small expansion of existing facilities. The Crow Agency recreation site involves tying together the present and future anticipated recreation resources. At the Big Horn Canyon National Recreation Area, recreation uses are designated generally northwest of the Big Horn Mountains below an elevation of 5,000 feet on both sides of the impoundment. A further characteristic of Alternative A involves the location of a new airport to the southwest of Crow Agency, thus reflecting a locally desired facility. No additions are made under alternative A to the railroad system. It is anticipated that rail access to a gasification plant



SKETCH PLAN
ALTERNATIVE "A"

SOURCE: HARRISON G. FAGG & ASSOCIATES

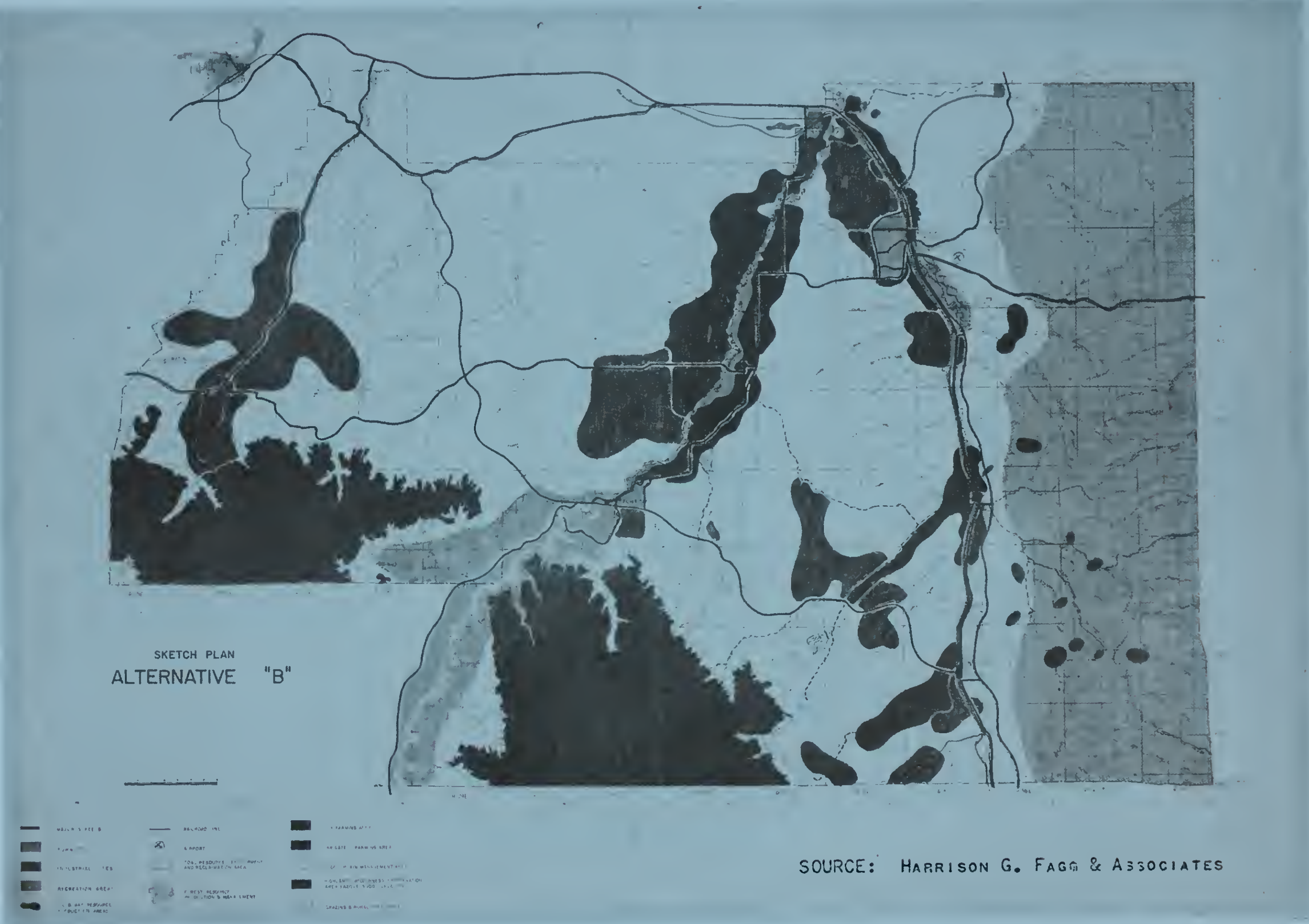
or other development related to coal resources could be provided from lines located north of the reservation.

Drawbacks to this alternative center on the weakness of population dispersion as an economic force and the cost attendant to providing facilities for development in many locations. Of course the towns exist now. All but two of them, however, have been losing population during the past decade. If the towns each are to retain their individual identity, economic opportunity must be present in each. The fact that manpower for industry is not concentrated in the right places may be a deterent to economic development. Tying all these towns together with road or highway improvements results in over twice the linage of thoroughfares presented in one of the other alternatives. The development of additional population in the smaller of these towns will require the development of water and sewer systems to accommodate each.

Alternative B sketch plan focuses attention on growth in Crow Agency and the Fort Smith townsite. The concept of this alternative is to gradually phase out the other towns of the reservation, or at least limit them to their present approximate size. The plan accommodates increased accessability of the Yellowtail site and Crow Agency from both Billings and Sheridan via the most direct route possible. Major circulatory routes in this system include substantial improvement to the Hardin-Fort Smith road, development of a Billings to Yellowtail route, and development of a Yellowtail to Wyola route. Also, improvement of an existing alignment between St. Xavier and Pryor is suggested. Rather than a loop system provided to the coal resource production area, only improvement of an existing linkage to Crow Agency is provided. However, in this plan railroad access to this coal resource production site is provided.

Additional land is designated in alternative B for recreation purposes. Again, the Plenty Coup site at Pryor and Custer Reno-Benteen Battlefields development area are included, as are lands on either side of the Yellowtail Reservoir. Lands to the northwest of the Big Horn Canyon National Recreation Area contain a number of historic sites which may be of interest and value to recreation development. Additional lands along the Big Horn River north of the Yellowtail Dam including islands in the river are designated for recreation purposes to preserve them from intensive development.

Alternative B envisions growth in the Fort Smith and Crow Agency areas as a useful approach from the viewpoint of population concentration



SKETCH PLAN
ALTERNATIVE "B"

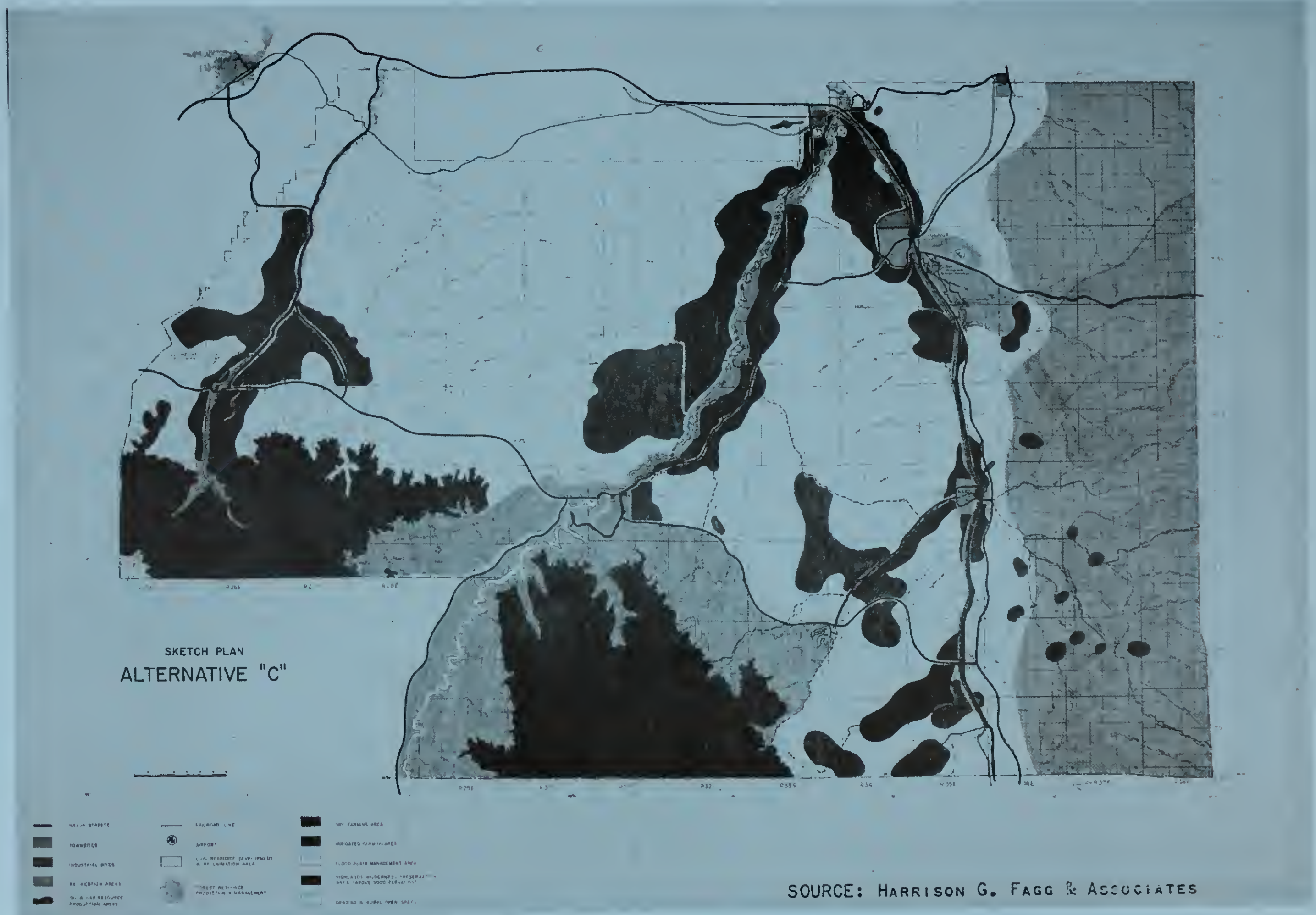
SOURCE: HARRISON G. FAGG & ASSOCIATES

and economics of scale in providing necessary community facilities, housing programs, and related matters. It may, however, meet with some unfavorable reaction from those reservation residents residing in Lodge Grass, Wyola, or Pryor. Industrial sites are envisioned at Crow Agency and at the coal resource development townsite. This might insure attraction of industry by virtue of the psychology of manpower concentration. An airport is located in this plan east of Crow Agency on Highway 212 with the secondary site selected, due to growth requirements of population concentrated at Crow Agency. Additional land is also designated at the Fort Smith site for recreation industry personnel home sites and vacation homes which are considered to be desirable at this location.

Alternative C provides for concentration of growth in Crow Agency and Lodge Grass with the other existing reservation towns to remain relatively stable in population. It is recommended that a mining town be created and that Fort Smith be expanded to accommodate workers in the recreation industry. Sites for vacation homes are to be provided in or near this community. Major thoroughfares in this plan provide good access both on and off the reservation to all towns. The greatest weak point is access between St. Xavier and Pryor. From a practical point of view, minimum linage of roads seems to make the plan more achievable, yet development of this plan would significantly improve the internal circulation from the present level with less streets devoted to the internal circulation system on the reservation, than contained in Alternatives A and B.

Crow Agency and Lodge Grass townsites are envisioned to expand. Expansion in both areas is to the west of the railroad and out of the flood plain area. This is consistent with the concept of flood plain management. Industrial sites are located at Crow Agency and at the proposed mining townsite.

Considerably more land is designated for recreation related uses in this plan than in the others. Predominant features include a recreation area, running off Pryor Creek through the Pryor Gap and including an area north of the Chief Plenty Coups State Park. This area provides a very scenic vista which may have recreation development potential. Considerably larger amounts of land are designated at the Custer-Reno-Benteen Battlefield sites and adjacent to either side of Highway 212. This land will provide opportunity for development of trails and other facilities for visitors to this area. Recreation use land surrounding the Big Horn Canyon National Recreation Area is con-


MAJOR STREETS
TOWNSITES
INDUSTRIAL SITES
RECREATION AREAS
OIL & GAS RESOURCE PRODUCTION AREAS
RAILROAD LINE
AIRPORT
COAL RESOURCE DEVELOPMENT & RECLAMATION AREA
FOREST RESOURCE PRODUCTION & MANAGEMENT
DRY FARMING AREA
IRRIGATED FARMING AREA
FLOOD PLAIN MANAGEMENT AREA
HIGHLANDS WILDERNESS, PRESERVATION AREA (ABOVE 5000 ELEVATION)
GRAZING & RURAL OPEN SPACE
R 29E
R 30E
R 31E
R 32E
R 33E
R 34E
R 35E
R 36E
R 37E
R 26E
R 27E
R 28E

SKETCH PLAN

ALTERNATIVE "C"

SOURCE: HARRISON G. FAGG & ASSOCIATES

siderably greater in Plan C than in the other plans. Because of the presence of historically significant points to the northwest of the Reservoir, all the land between the proposed circulation system and the 5,000 foot elevation highland wilderness preservation area is included. Similarly, to the southeast of the impoundment all lands below the 5,000 foot level are shown as in recreation area, recognizing the driving for pleasure potential of this setting. Designation of recreation uses extends east to the Lodge Grass Reservoir which may become locally significant for resident recreation activity.

This alternative sketch plan envisions designation of a flood plain recreation area along the Big Horn River. This would protect land within a corridor varying from one-half to one mile wide centering on the streambed from development pressures, thus preserving it for boaters, fishermen, and other recreational participants. Sites could be developed along the river for boat launching and other water-related activities. Alternative C envisions establishment of a rail line from Crow Agency to the mining townsite. An airport is also designated in this plan to the southeast of Crow Agency, near the motel complex development.

It can be readily seen that each of these alternative concepts has its unique features. Certainly the basic features are desirable to the reservation. The plans are not purely land use plans, but rather activity and management plans which will involve enactment of specific kinds of regulations and commitment of specific amounts of funds to achieve. From these sketches, a plan, or perhaps the best points of each, should be selected as the basis for future planning activity. The final plan decided upon after appropriate review and modification as required, will be detailed in the completion of this Comprehensive Planning Effort.

Evaluation of these concept plans should focus on their interrelationships with the reservation's physical setting and economic potential. Good management practices are necessary for this plan to accomplish anything of lasting importance. The future land use plan devoloped from these concepts must be geared to sound land management. Preservation of significant areas and utilization of reservation land to achieve its economic potentials are paramount to accomplishment of principal reservation goals.

FUTURE LAND USE NEEDS

Forecasts of future land use needs for the Crow Reservation through the year 1995 were developed using a number of sources of information and techniques. Basically the forecast of population and economic growth are primary determinants of future land needs, but information developed in the existing land use study was also employed, along with some norms of rural community land use derived from general planning experience. Data is presented for periodic increases by five year increments through 1995 along with aggregate future land use needs. The expected land use level in the year 1995 is indicated. These figures constitute a major portion of the Futre Land Use Plan for the Crow Reservation.

The Crow Reservation is a low density area with a small centration of industrial and commercial activity, a number of public and semi-public uses, and a proportional abundance of streets and right of way. Quantitative elements of the Future Land Use Plan for the area generally indicate a continued development of residential land placing greater emphasis on higher concentrations of residential development within towns. Industrial Opportunities outlined in the Population and Economic Study suggest a certain amount of land is needed for development of manufacturing activity. Commercial land needs are identified to accommodate population growth and an anticipated growth of local affluence. Land quantities are provided for trade, service and other activities to serve the residents of the reservation as well as potential tourists. The forecasts also include land for public and semi-public utilization and additional land for streets and rights of way.

In determination of a schedule of future growth in the area, a table of land use needs was prepared for reservation townsites from the detailed forecasts contained in this report. It illustrates an average periodic need of 112 acres of land for townsite use each five years until 1995. Based on the study of existing conditions on the Crow Reservation, projections of future activity levels were made to provide a dimensional planning proposal. Three important factors are involved in this projective process: The population and economic forcasts, future land use needs, and potential spatial distribution.

Forecasts of land quantities necessary to meet estimated future expansion needs were developed. These provide the basis for estimating growth in land use by five year increments from the present to 1995. Allocations were made for residential, industrial, commercial, public/semi-public, and streets and rights of way land use categories. Also, resource oriented land use categories were established and designated outside townsites to achieve certain important reservation goals. Primary determinants of future land use needs are population and economic growth. Information contained in the Population and Economic Study along with some norms of land use common to rural areas constitues the basis for most determinations. These elements generally indicate the continued development of residential lands placing greater emphasis on rural density than has been experienced in the past. Land needs for industrial opportunities suggest a large amount of land for industrial parks which relates importantly to the underdeveloped local manufacturing industry. Commercial needs are provided to accommodate population growth, and an anticipated rise in affluence among the local residents. Land is also provided for retail trade including office uses and facilities to bolster the local tourist trade activity. Land for public and semi-public uses, including the park needs in each community, is particularly responsive to the general public needs of the growing reservation.

POPULATION AND ECONOMIC OUTLOOK

Agricultural, industrial, and recreational development are the foundation of the creation of an improved economy for the Crow Reservation. The future promises to be dynamic with advances on the reservation influenced by abundant land, natural resources, the people and their increased motivation. The south-central Montana location of the reservation can influence growth when coupled with improving road circulation and the potential for natural resource development and increasing levels of educational, cultural, and recreational opportunities. Economic potential is derived from the basic resources and agriculture will continue to play an important role in the economy.

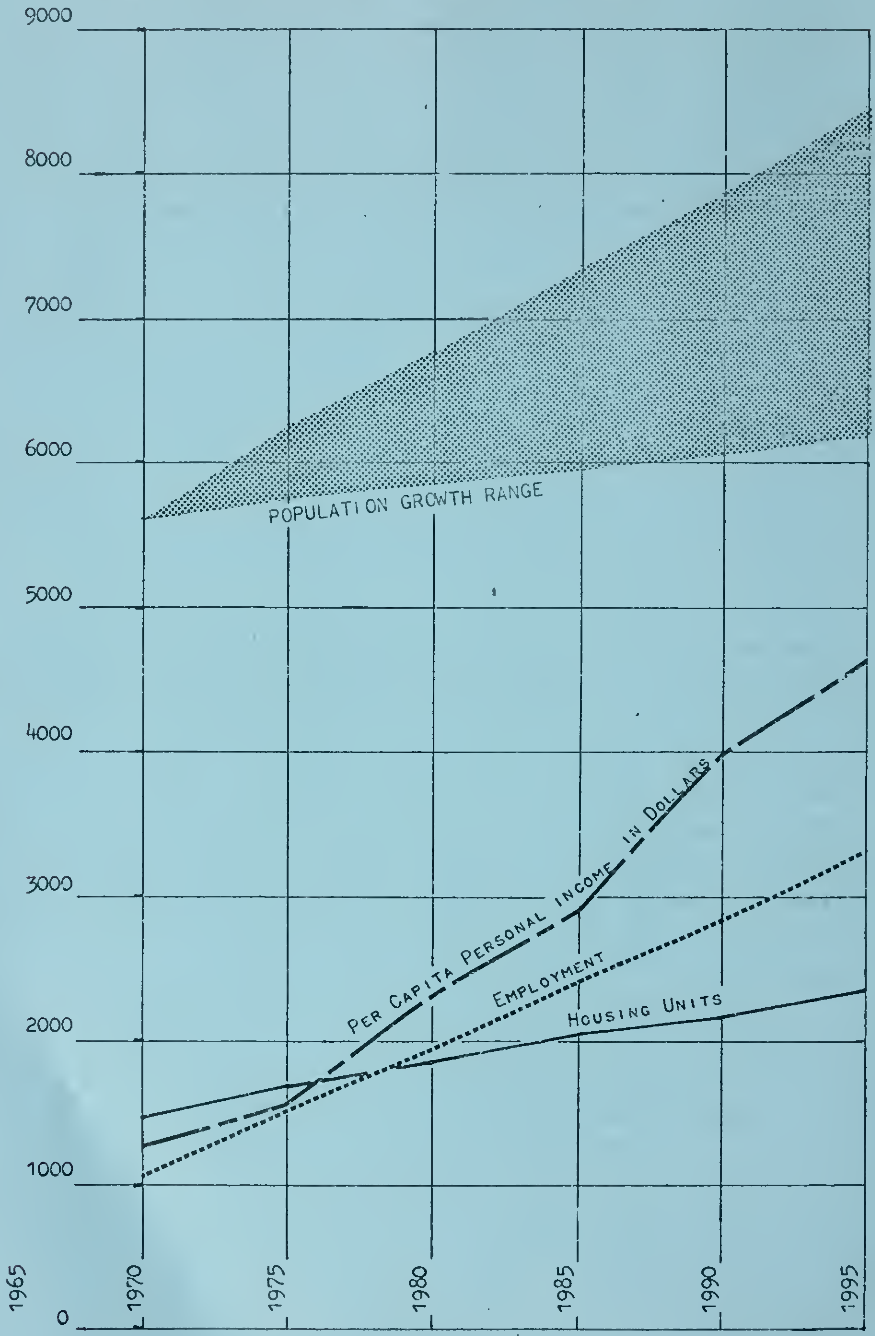
The Crow Reservation has experienced constant but conservative growth pattern for the past several decades. Indications are that this trend will continue through 1995, when it is anticipated that the area will have a population of about 8500 people. The rate of employment growth forecasted for future years, when compared with population projections, indicates that employment will exceed population growth in terms of percentage gain through the population period. It is projected that employment participation rates will increase from current levels. Population growth within Crow Reservation communities is expected to amount to at least one half of the total reservation growth. An additional 4500 people are forseen during the 25 year forecast period which is an increase of about 51% over the 1970 Census level. Also, it is expected that personal income gain per capita will increase nearly four times its current level. Figure 1 illustrates a summary of selected social economic forecasts for the Crow Reservation as adapted from the Population and Economic Study. These factors will all influence the anticipated growth as indicated for the area.

RESIDENTIAL LAND NEEDS

In developing forecasts of future land use needs for residential purposes, population growth was the primary indicator employed. Earlier in the planning program, a detailed study was made of population growth and forecasts were prepared for the Crow Reservation. This study employed various techniques of population analysis to provide an overall look at future population expectations. In order to apply this information to the development of a future land use plan for the Crow Reservation, it was necessary to allocate these forecasts. This was accomplished by analyzing relationships between the population of the total reservation and its communities. It was found that as a percentage of the reservation's total population, the townsites in the area have experienced a population increase each decade. Based upon this trend, it was estimated that about one-half of the Crow Reservation's future population growth will occur within the reservation townsites through 1995.

Translation of the expected population growth and the related housing demands was accomplished by estimating new and replacement housing needs through the forecast period based on information contained in the Initial Housing Element Study. The aggregate demands for allocated housing density help to develop more detailed requirements for the area. Land requirements to accommodate new residents were computed from existing residential land use per unit relationships which compare favorably with those of other rural areas. Overcrowding is a housing problem on the Crow Reservation and indicates a need for additional homes. Approximately 98% of the reservation population resides in dwelling units.

SUMMARY OF SELECTED SOCIO-ECONOMIC FORECASTS
CROW RESERVATION 1970 – 1995



Population per occupied dwelling unit in the area has declined during the past decade, and following regional and national trends, the decline should be expected to continue in future years. For planning purposes, it was assumed that occupied dwelling units would average 4.4 occupants in 1970 and drop to 4.0 in 1995. Combining the population requiring housing units and patterns of occupancy per dwelling unit yields additional dwelling unit requirements. These requirements are estimated to increase substantially through 1980 and then to stabilize by 1995. Rental vacancies on the reservation are presently adequate to supply the demand. The long range housing plan should allow for growth of the rental housing market, and it is suggested that by 1995 the number of standard rental units on the Crow Reservation should increase by 50% over the present level. Achievement of this vacancy rate was an input in the development of estimated new housing needs. Additional occupied housing units required, combined with this long range vacancy rate objective, yields periodic dwelling unit increases totaling 484 new houses within the Crow Reservation by 1995.

A large percentage of the total housing demand in any community involves replacement of existing housing. Increasing standards of acceptability and the normal aging and deterioration of structures are responsible for the replacement housing needs as analyzed in detail in the Initial Housing Element Study. In the initial years of the forecast period, a large portion of the housing indicated as substandard is scheduled for replacement. By 1980 all units classified as overcrowded, deteriorated, or lacking plumbing facilities should be corrected. Achievement of this objective should replace all existing substandard housing on the Crow Reservation. Cummulatively, 105 houses will be replaced by 1980 to accomplish this goal.

In order to determine the land needs and to provide the land required for new and replacement housing on the Crow Reservation residential development characteristics were derived. Generally, it was established that low density housing within the Crow Reservation has developed principally outside the townsites at a mean density of approximately one unit per acre. Higher density development exists in the community areas averaging 2.5 units per acre. Combining these acreage factors with rural housing density needs gives low and high residential density needs for each period of time. It is recognized that both of these levels of residential intensity are low by generally accepted standards. However, considering the reservation situation and the desire of its residents to live in an open space environment there is no need to suggest development of higher density housing. Utilizing this forecasting technique reveals that by a demand for 377 acres for rural low density residential units and 194.6 acres for the higher density housing by 1995. Proportional distribution of the growth indicates that 43.7 percent of the housing units added would be in the lower density rural portion of the reservation. Land allocated to these lower density units amount to 66.0 percent of the total residential land use forecast. Table 1 summarizes the estimated need of land for residential development on the Crow Reservation by density and location characteristics.

Residential development can be located in a variety of situations. Ideally, slightly rolling land is most desirable, but either hilly or flat areas which are well drained can also be successfully developed for this use. Residential development should not occur in flood plain areas or in areas with surface outcrops of unstable soils. Six principals have been found as desirable characteristics of reservation residential communities:

1. SIZE: A reservation community should provide housing for the population residing in a single town. In the larger towns, the population should be adequate to require one elementary school. The actual area of the reservation community will depend upon its population.
2. BOUNDARY: The community should be bounded by an access street sufficiently designed to facilitate traffic by-passing the community instead of passing through it.
3. OPEN SPACE: Park and playground space planned to meet the needs of the community's residents should be provided.
4. PUBLIC AND SEMI-PUBLIC SITES: Sites for government buildings, schools, churches, and other institutions appropriate to the community and having service spheres coinciding with town limits or service areas should be suitably grouped about a central point or common area within the community. A combination of such sites with recreation areas may be desirable. School and park sites in a community need not be surrounded by access streets.
5. LOCAL SHOPPING AREAS: With significant concentrations of population, community shopping facilities should be

TABLE 1

ESTIMATED INCREMENTAL LAND REQUIREMENTS FOR HOUSING

CROW RESERVATION
(PERIODIC NEEDS)

	1971-75 1/	1976-80 1/	1981-85	1986-90	1991-95	1971-95 TOTAL
TOWN UNITS	136	136	68	67	77	484
RESIDENTIAL LAND REQUIREMENTS 2/	54.4AC.	54.4AC.	27.2AC.	26.8AC.	30.8AC.	193.6AC.
RURAL UNITS	83	83	68	66	77	377
RESIDENTIAL LAND REQUIREMENTS 3/	83.0AC.	83.0AC.	68.0AC.	66.0AC.	77.0AC.	377.0AC.
TOTAL NUMBER OF UNITS	219	219	136	133	154	861
TOTAL RESIDENTIAL LAND REQUIREMENTS	137.4AC.	137.4AC.	95.2AC.	92.8AC.	107.8AC.	570.6AC.

1/ INCLUDES ADDITIONAL UNITS NEEDED TO OVERCOME OVERCROWDING AS OUTLINED IN INITIAL HOUSING ELEMENT STUDY.

2/ AT 2.5 UNITS PER ACRE

3/ AT 1.0 UNITS PER ACRE

SOURCE: HARRISON G. FAGG AND ASSOCIATES.

located at the edge of town, preferably on the traffic access to servicing highways. Local shopping centers should serve the residents of the community, and rural residents who live within convenient distances.

6. INTERNAL STREET SYSTEM: The internal street system of residential communities should be designed to facilitate circulation within the community. Good access to major arterials and a network of collector streets and minor loop cul-de-sac streets should exist to discourage through traffic from cutting through each community.

INDUSTRIAL LAND NEEDS

Forecasts of future industrial land needs were computed for the Crow Reservation based upon existing conditions, prospects for industrial development, and relationships between land use and employment. These figures were checked for validity with those presented in other comprehensive planning studies and were found to be generally consistent with them. The relationships were grounded, in fact, resulting from a detailed analysis of other economic development studies of the reservation completed at various times.

Acres of industrial land use needs were based upon existing land use information including detailed information on manufacturing, transportation, communication, public utilities, and contract construction activities. Estimates of employment for 1970 were also prepared. The relationship in 1971 between acres of land use and employment by sector was evaluated and employees per acre were estimated for each of the principal activities. The average industrial acre of land has accomodated about eight employees on the Crow Reservation, but there is a considerable variation between land requirements of the assorted industries which might be attracted to it. Two principal industrial sites were considered one of which would be involved with manufacturing and the other involved with processing natural resource production.

Forecasts presented by industry in the Economic Basis Study were used as the basis for forecasting future employment levels within the Crow Reservation and for determining future industrial land needs. Through this process employment forecasts were developed for each industrial sector in 5 year increments from 1970 to 1995. This information provided the

TABLE 2

ESTIMATED INCREMENTAL LAND REQUIREMENTS FOR INDUSTRIAL DEVELOPMENT

Crow Reservation

(Periodic Needs)

	1971-75	1976-80	1981-85	1986-90	1991-95	1971-95 TOTAL
General Manufacturing Employment 1/	100	100	100	100	100	500
Indicated Land Requirements 2/	6.6Ac.	6.6Ac.	6.6Ac.	6.6Ac.	6.6Ac.	33.0Ac.
Resource Processing Employment 3/	25	25	25	25	25	125
Indicated Land Requirements 4/	6.3Ac.	6.3Ac.	6.3Ac.	6.3Ac.	6.3Ac.	31.5Ac.
Other Industrial Uses 5/	3.3Ac.	3.3Ac.	3.3Ac.	3.3Ac.	3.3Ac.	16.5Ac.
TOTAL INDUSTRIAL LAND REQUIREMENTS	16.2Ac.	16.2Ac.	16.2Ac.	16.2Ac.	16.2Ac.	81.0Ac.

1/ Per Reservation Employment Goals

2/ At an average of 15 workers per acre

3/ 25% of Reservation mineral resource production employment goal

4/ At an average of 4 workers per acre

5/ 50% of manufacturing land needs

SOURCE: Harrison G. Fagg and Associates.

basic industrial land that would be needed. An estimate of the employees per acre for future years was developed and applied to the estimates of employment by industrial sector. This resulted in estimates of future land use needs in acres by industrial sector as presented in Table 2. It is estimated that an additional 81 acres of land will be necessary for this use on the Crow Reservation by 1995. The periodic growth forecasted for use within this time period is also portrayed in the table.

Future land use forecasts for reservation townsites include industrial lands as approximately 9.3% of the total future land needs. Lands for industry should be generally level or slightly sloping and available in sufficient quantity to provide for concentration of industrial establishment and further growth of establishments at selected locations throughout the reservation. Industrial sites should have good major street access and some should be adjacent to rail and/or air transporation facilities.

COMMERCIAL LAND NEEDS

Forecasts of land needed to accommodate the Crow Reservation's future commercial activities were developed from various forecasts prepared by the consultant. From various sources, materials were accumulated to substantiate estimates of future commercial land needs. The estimates were prepared based upon three principal contributing factors to commercial development: population growth, personal income growth; and trade and service employment growth. The average of the developed forecasts, based of each of these indicators, was used as the final land use outlook indication for commercial land use.

Population based forecasts on future commercial development needs within the reservation townsites provides the most conservative estimate of commercial land because of the current relatively low commitment of land for this purpose. The income based forecast of commercial land use, on the other hand, is probably an over estimate of needs as an unusually high income gap needs to be overcome by the residents to match off-reservation income levels. Accomplishment of this goal will not necessarily require proportionately greater amounts of commercially developed land. This approach was included to reflect income growth as a factor contributing to commercial development but not as the sole basis for anticipating future commercial land needs. Forecasted employment in the trade and services sector closely approximates the final increment forecast for commercial land needs which were prepared by averaging the three forecast techniques shown in Table 3.

Additional commercial land needs amount to 9.6 acres during each five year pe d as forecasted for the Crow Reservation. In total, 48.2 acres of additional commercial lands are forecasted for the Crow Reservation during the twenty-five year period. Overall, this equals 5.8 acres per 100 population or 1.9 acres per million dollars of personal income growth or 14 acres per 100 employees in trade and service activities on the reservation. One acre of commercially developed land is forecasted for each 11.8 acres of residential development. Commercial land amounts to 8.5 percent of the future land use needs anticipated for the reservation townsites during the forecast period.

Ultimately, two types of commercial developments seem appropriate to the Crow Reservation environment.

1. The townsite commercial activity including a general concentrated commercial area to serve each community and surrounding rural area at a reasonably low density; and
2. The concentration of commercial activity within recreation related commercial centers in recreation designated portions of the reservation.

Concentrated recreation related commercial activity centers are generally more efficient than free-standing locations. Land use conflicts between the business and the scenic rural environment can be effectively controlled through appropriate allocation of transitional buffer uses. Also, the development of commercial centers will help facilitate the provision of adequate access, traffic circulation, and parking necessary to the success of recreation areas. Some limited, adequately controlled commercial activity can be distributed throughout each reservation community to serve current needs. Furthermore, a limited amount of highway-type commercial use might logically be developed in proximity to major air, rail, and highway access points in the area. All of the commercial development forecasted in this portion of the report is to primarily serve the resident population base as projected to develop within the reservation townsites.

PUBLIC AND SEMI-PUBLIC LAND USES

Land needed for public and semi-public uses on the Crow Reservation is dependent on population growth and decisions made by public and semi-public organizations with regard to the expenditure of funds for facility construction. It was necessary to make provision in the Future Land Use

ESTIMATED INCREMENTAL LAND REQUIREMENTS FOR COMMERCIAL DEVELOPMENT

Crow Reservation 1/
(Periodic Needs)

	1971-75	9176-80	1981-85	1986-90	1991-95	1971-95 TOTAL
POPULATION GROWTH	620	520	547	534	614	2,835
INDICATED LAND USE NEEDS	5.6 ac.	4.7 ac.	4.9 ac.	4.8 ac.	5.5 ac.	25.5 ac.
PERSONAL INCOME GROWTH ($000) 3/	1,419	6,300	5,300	5,700	5,800	24,519
INDICATED LAND USE NEEDS	4.3 ac.	18.9 ac.	15.9 ac.	17.1 ac.	17.4 ac.	73.6 ac.
LOCAL TRADE AND SERVICE EMPLOYMENT 4/	50	100	50	75	75	350
INDICATED LAND USE NEEDS	6.5 ac.	13.0 ac.	6.5 ac.	9.8 ac.	9.8 ac.	45.6 ac.
AVERAGE OF INDICATED COMMERCIAL LAND USE NEEDS	5.4 ac.	12.2 ac.	9.1 ac.	10.5 ac.	10.9 ac.	48.2 ac.

1/ This excludes Recreation Enterprises. All of this use is allocated to townsites.

2/ At 0.9 acres/100 population

3/ At 0.003 acres/$1000

4/ At 0.13 acres/employee

SOURCE: Harrison G. Fagg and Associates Estimate

Plan for at least an appropriate amount of land to house such activity, although forecasting decisions made by diverse groups cannot be based entirely on fact. In order to accomplish this, public and semi-public land users were subdivided to government, education, religion, cultural and recreational, and cemeteries categories. Future land use needs in the total category has unique requirements and characteristics. For forecasting purposes, the relationships between existing land use and population were examined and comparisons made with local and national trends and specific conditions for each community. By this method, desirable land use adjustments to population were developed. The analysis suggested that land use per population for government operations should generally decline and that the ratio for educational, religious, and cultural and recreational purposes should increase. Land needed for cemeteries per population was forecasted to remain constant. Public administration employment which is a significant factor in determining governmental land use needs is expected to increase more rapidly than total employment on the Crow Reservation throughout the forecast period as has been the case during the past decade. Lands for educational activities in the area can be expected to grow. However, the effects of the declining birthrate experienced during the 1960's should be felt by the educational facilities in the area and it is anticipated that the next twenty years should show a period of facilities catching up with population and a lower rate of additional student demand growth. The number of churches locally is not particularly high and this characteristic will probably continue during the forecast time period. Lands for cultural and recreational facilities, especially the amount of park land provided on the Crow Reservation per capita, is low. It is suggested that it should be increased during the forecast period. Cemetary space is well provided within the Crow Reservation Additional cemetary land should be established at the present level of use per population as it becomes needed.

Table 4 contains a schedule of five year increments of conservative public land needs within the Crow Reservation. The forecasting technique involved multiplying the periodic estimated population increase developed from the Population and Economic Study by the land use per 100 population figures for the five public and semi-public use types considered. This technique resulted in the estimate of periodic land use needs for each of the use types. These were aggregated to total public and semi-public land use needs.

TABLE 1

ESTIMATED INCREMENTAL LAND REQUIREMENTS FOR PUBLIC AND SEMI-PUBLIC USES

CROW RESERVATION TOWNSITES

	1971-75	1976-80	1981-85	1986-90	1991-95	1971-91 TOTAL
POPULATION GROWTH	620	520	547	534	614	2,835
LOCAL PARKS AND RECREATION 1/	41.0 AC.	37.0 AC.	---	---	---	78.0 AC.
GOVERNMENT USES 2/	3.1 AC.	2.6 AC.	2.7	2.7	3.1	14.2 AC.
EDUCATIONAL USES 3/	9.3 AC.	7.8 AC.	8.2 AC.	8.0 AC.	9.2 AC.	42.5 AC.
RELIGIOUS USES 4/	1.2 AC.	1.0 AC.	1.1 AC.	1.0 AC.	1.3 AC.	5.6 AC.
CEMETARY USES 5/	1.2 AC.	1.0 AC.	1.1 AC.	1.0 AC.	1.3 AC.	5.6 AC.
TOTAL PUBLIC AND SEMI-PUBLIC LAND REQUIREMENTS	55.8 AC.	49.4 AC.	13.1 AC.	12.7 AC.	14.9 AC.	145.9 AC.

1/ INDICATES LOCAL PARK DEVELOPMENT PROGRAM ADVANCED IN THE RESERVATION DEVELOPMENT SECTION.

2/ AT 0.5 ACRES PER 100 POPULATION

3/ AT 1.5 ACRES PER 100 POPULATION

4/ AT 0.2 ACRES PER 100 POPULATION

5/ AT 0.2 ACRES PER 200 POPULATION

SOURCE: HARRISON G. FAGG AND ASSOCIATES.

Table 4 also contains an indication of suggestions made with regard to public and semi-public uses on the Crow Reservation. Results of this analysis indicate that an additional 145.9 acres will be necessary to house public and semi-public activities in the Crow Reservation by 1995. Considerably more land than this could be allotted to these purposes if public and semi-public decisions warrant. These figures should not be used as an absolute indication of the maximum amounts of lands necessary but can be employed in evaluating the adequate needs of land use levels through the planning period. Forecasted public and semi-public land uses amount to 25.9 percent of the total future needs of Crow Reservation townsites. On a population basis, the increase is 6.8 acres per 100 population which includes considerable catch-up effort in the area of community parks. For each 1.3 residential acres added to the townsites an additional one acre of public and semi-public lands should be added.

Land use standards for playgrounds and other local parks and recreation needs are presented in other sections of this comprehensive planning effort. Standards for land use in each community for this purpose is presented with allocations made to each townsite in Table 5. Maximum design populations were established for each reservation townsite which ranges in size from 150 to 2,000 in population. Because of the lack of designated play space in the towns and availability of land, it is recommended that adequate amounts of land be established in each reservation town in the quantity shown in Table 5 by 1980. Overcoming this shortage will benefit many reservation children and young people.

Land to accommodate streets and rights-of-way within the reservation were computed on a percentage basis. It is anticipated that a higher level of efficiency in the development of streets and rights-of-way can be achieved through the effective use of subdivision regulations and establishment of a comprehensive major thoroughfare plan for the reservation. Therefore, land devoted to this use in the townsites was estimated to total 20 percent of the planned development or a demand for 93.7 additional acres through the period.

Convenient accessibility to the population should be the primary locational criteria for public and semi-public land uses. Generally, educational, religious, cultural and recreational activities should be primarily community oriented. Community scale facilities also include locations for government, although these facilities have reservation-wide

TABLE 5

AGGREGATE ESTIMATED DISTRIBUTION OF COMMUNITY PARKS AND RECREATION SPACE NEEDS

Crow Reservation Communities

	FULL DEVELOPMENT DESIGN POPULATION	1971-1995 PARKS AND RECREATION LAND NEEDS
CROW AGENCY	2,000	21.4 AC.
LODGE GRASS	1,500	18.7 AC.
WYOLA	150	0.3 AC.
ST. XAVIER	150	0.3 AC.
PRYOR	150	0.3 AC.
FORT SMITH TOWNSITE	1,000	18.5 AC.
MINING TOWNSITE	1,000	18.5 AC.
TOTAL	5,950	78.0 AC.

SOURCE: Harrison G. Fagg and Associates

importance. Cemeteries generally should be located in large sites outside of the towns.

SUMMARY OF TOWNSITE LAND REQUIREMENTS

A summary of the preceding material, which emphasizes the future land use needs of the reservation townsites is contained in Table 6. Land uses within Crow Reservation townsites are forecasted to increase 140 percent from 399.2 acres in 1971 to 961.6 acres by 1995. These land uses will play an increasingly significant part of the Crow Reservation's future activity.

PRINCIPAL CIRCULATION FACILITIES

The future circulation system proposed for the Crow Reservation includes all major streets, railroads and rights-of-way on the reservation. In addition, a proposal is made regarding the establishment of an airport at Crow Agency. Significant additions to the major thoroughfare and railroad systems are included in these land use proposals. Major thoroughfare improvements proposed include:

1. ompletion of Interstate 90 parallel to U.S. Highway 87 through the Little Big Horn circulation corridor.
2. Development of a principal east-west reservation linkage from Wyola to Fort Smith.
3. Improvement of the present linkage between St. Xavier and Pryor.
4. Substantial improvement of the Hardin to Fort Smith road.
5. Development of a significantly improved access between Billings and the Big Horn Canyon National Recreation Area.
6. Improvement of the existing route between Crow Agency and the proposed coal resource production townsite.
7. Completion of the Lovell, Wyoming to Fort Smith Route.

Land commitments to realize these major road improvements amount to addition of approximately 658 acres of land for right-of-way use. This amount of land is for major reservation thoroughfares only and does not include additional land needed for local streets within reservation townsites as described in Table 6. When the 658 acres of major street rights-of-way are combined with the 94 acres forecasted for local street development within the townsite, a aggregate total of 752 acres for reservation thoroughfares is indicated for the forecast period.

When related to the area population, the reservation level of street

TABLE 6

SUMMARY SCHEDULE OF INCREMENTAL LAND USE NEEDS

Crow Reservation Townsites

(Periodic Needs)

Land Use Category	1971-75	1976-80	1981-85	1986-90	1991-95	1971-95 TOTAL
Residential	54.4 ac.	54.4 ac.	27.2 ac.	26.8 ac.	30.8 ac.	193.6 ac.
Commercial	5.4	12.2	9.1	10.5	10.9	48.2
Industrial	16.2	16.2	16.2	16.2	16.2	81.0
Public and Semi-Public	55.8	49.4	13.1	12.7	14.9	145.9
Local Parks and Reservation	41.0	37.0	---	---	---	78.0
Other	14.8	12.4	13.1	12.7	14.9	67.9
Streets and Rights of Way 1/	26.4	26.4	13.1	13.2	14.6	93.7
TOTAL DEVELOPED LAND	158.2 ac.	158.6 ac.	78.7 ac.	79.4 ac.	87.4 ac.	562.4 ac.

1/ 20% of Non Streets and Rights of Way Developed Land.

SOURCE: Harrison G. Fagg and Associates.

development seems very high. One acre of land for street purposes is called for each additional 3.7 reservation residents. These proposals go much farther than only serving additional population. Construction of the proposed routes will facilitate badly needed internal circulation between reservation communities and will open up many economic opportunities. These include local resources which cannot be immediately developed to their full potential because of inaccessibility.

Railroad development is foreseen for the reservation and will consist of providing rail access to the coal production townsite area. Recognizing that good freight service will make development of the local coal resource economically realistic, this proposal seems essential. Alternative routes were reviewed in the initial concept studies and several factors including local desires, appropriateness, and opportunities for funding assistance on the reservation indicate that a route similar to the one proposed would be most satisfactory. Of course, engineering determinations must be made to finalize the most desirable routes within the proposed corridor. Approximately 15 miles of railroad lines would be involved in this proposal, thus, taking about 360 acres of land in a railroad right-of-way. Such an amount of land amounts to 36% of the foreseen land addition in the streets and rights-of-way category.

The plan further proposes that an airport need be developed for the Crow Reservation at Crow Agency. The two limited capability landing facilities near Hardin are to be retained. The Crow Agency facility should be capable of accommodating up to intermediate size jet equipment. From a site near Crow Agency, the airport should adequately serve the needs of the reservation and Crow Agency as the community where population, industrial sites, government and administrative headquarters, and recreation attractions are concentrated. Land committed for this facility would include about 200 acres. Presently, airports on the reservation constitute 0.0173% of this land area. Retention of the two existing facilities as establishment of this proposed new one will increase the land commitment of airport use to 0.0260% of the reservation's land resource.

Collectively, road circulation and other right-of-way developments proposed for the Crow Reservation during the forecast period involve utilization of an additional 1312 acres of land including local streets within the townsites. While this amount of land is insignificant in proportion of the reservation's total resource, the value of these proposals is critical to accomplishment of the other land use proposals and attainment of the reservation goals.

RECREATION DEVELOPMENT SERIES

Recreation development is economically and aesthically important to the Crow Reservation. The proposed land use plan envisions designation of some 329,121.8 acres for recreation purposes. This land is to complete recreation developments in large open space areas, as an economic activity and to retain natural areas for conduct of traditional Indian outdoor activity. Important growth in recreation will cause an addition of 500 workers in related activities by 1995. Today an estimated $5 million in recreation services sales could be captured by the Crow Reservation if proper development occurred. The economic impact, however, should not result in spoiling the reservation environment. Therefore, designation of lands for recreation involve equally important development and conservation considerations. It is the goal of this plan to derive optimum economic benefits from the recreation potential of Crow Reservation resources while leaving the area undisturbed for present and future resident generations. Only development which will enhance local resources should be considered for development in order to retain the present quality.

All three of the land concept proposals for the Crow Reservation include designation of a number of large areas for recreation. The basic reason for designating recreation as a principal use resides in the availability of land for this purpose and the preservation of resources with consideration to their development. The visual attractiveness of the reservation recreation areas can be controlled by the application of reasonable standards in their development. Design quality, adequacy of facilities and protection from unsightly conglomerations of advertising signs and other cheapening influences within the area will make a visit to Crow Reservation recreation sites more enjoyable for both local residents and tourists. One of the principal recreation development areas centers around the Reno-Benteen and Custer National Monuments and the Sun Motel Heritage Park development which recently opened. An important consideration here is designation of significant open space resources to surround the Monument, thus, providing vision from the site with minimum evidence of human habitation. Within this open space recreation area, hiking and riding trails must be developed as well as picnic and other designated vacation-type activity sites. Additional development centered on the Sun Motel is foreseen. Signs and architecture of buildings in this area are important and should be controlled. Interstate 90 is important to the area from the accessibility point of view and its relationship to the proposed airport makes convention activity and business visits possible. Reasonable proximity of this location to both Crow Agency and Lodge Grass enhances manpower availability for facilities developed.

A second principal recreation development area focuses on the Big Horn Canyon National Recreation area. This location contains the largest recreation land area and includes all land fronting on the Big Horn Reservoir plus, a large amount of land to the northwest of the impoundment, which contains a number of historically interesting sites. All of the land east of the lake up to 5000 feet elevation are included in the area, as recognition of the importance of inter-relationship between the reservoir and the Big Horn Mountains to a total visual experience. Land extending east from the Big Horn Mountains, including the foothill areas is also designated as part of the recreational environment. Control of the frontage to the Big Horn recreational area is considered important as the dramatic natural environment will serve to attract more use than hodge-podge signs and tar paper shack enterprises. Commercial-residential development within this area is centered on the Fort Smith townsite and Pretty Eagle Point. Between the two developments, an area of land is designated for very low-density vacation home development sites.

Accessibility is a crutial consideration to recreational utilization and development of the area. When completed, the Billings to Yellowtail, Wyola to Yellowtail, Lovell to Yellowtail thoroughfare proposals will combine with the Hardin to Yellowtail road to provide excellent accessibility to the area from all reservation townsites. The thoroughfares will also serve to concentrate tourists who are to be served by facilities both proposed and under development.

Wildlife conservation is another important function served by the combination of lands designated for recreational use and the highlands preservation areas. If appropriate hunting regulations could be adopted and enforced in this area, it would become a significant wildlife habitat area useful for promulgating a number of species in both their summer and winter habitats. From the viewpoint of conservationalist and hunter, this use of recreation areas is most desirable.

The third principal recreational area is a lineal strip from Pryor and the Plenty Coups State Monument southward to the topographically spectacular Pryor Gap. This proposed recreation area is designed to vary from one to two miles wide and centers on Pryor Creek. It could feature historic interest sites as well as hiking, riding, and driving for pleasure activities. The area will also serve to tie the East and West Pryor Mountains highland wilderness preservation areas. Development activity involvement would be primarily at Pryor, where a small cluster of recreation-commercial activities might be established if development should become a reality. The area will influence preservation of a significant environmental asset to the reservation.

A river park area extending the full length of the Big Horn River from Yellowtail Dam to Hardin is designated as the fourth principal recreation area. It is envisioned that this park will be utilized both as a recreation resource and a flood plain conservation and management area. A large number of marsh areas adjacent to the river banks and islands account for the abundance of wildlife inhabiting this area. Agricultural lands adjacent to the river are primarily used for grains.

The Big Horn River offers a diversity of water related outdoor activities for both reservation residents and tourists. The townsite of St. Xavier lies near the center of this stretch of river and offers a potential site for limited recreation related commercial clusters to accommodate water-based sports enthusiasts. The strip of land designated for recreational use will vary in width from one-half to one mile. Many points of access could be developed from the paved highway that parallels the river route. Those access points would provide outdoor enthusiasts with new potentials for boating, fishing, hunting, nature pursuits, wildlife conservation, hiking and riding, and other related activities.

Principals to be employed in developing the commercial aspects of recreation have been stated throughout this planning study. Because they capture the bulk of travelers expenditures, lodging places, restaurants, and eating places, and service stations should be essential elements of commercial recreation development clusters. The locational viability of several establishments in close proximity, which both compete with and complement each other, is important to financial success of the enterprises. Franchises should not be sold for exclusive development rights in any single area to any one concessionaire. Several principal clusters of recreation related commercial development is suggested. One is at the Sun Motel-Heritage Park location near the Custer and Reno-Benteen Battlefield Monuments; one is on Pretty Eagle Point of the Big Horn Canyon Reservoir; and one should relate to the Chief Plenty Coup Monument-Pryor Gap Recreation Area. Possibly a fourth cluster of smaller magnitude could be developed in St. Xavier area, related to the Big Horn River recreation activity.

Quantitatively, the Land Use Plan calls for designation of an additional 228,356.4 acres for recreational use throughout the forecast period. Of all lands affected by the proposals of this plan, recreation use consumes some 19.6 percent. In 1971, 0.03 percent of the reservation's land resource was designated for recreation purposes. By 1995, the design calls for about 10 percent of the land committed to this activity. Some of the designated recreation lands lie within Flood Plain Management Areas. However, this is consistent as recreational utility is a prime use expected within the framework of proper flood plain management.

Finally, recreation areas should be established in the areas where timbered land meets the grasslands. These areas require special attention from the point of view of wildlife preservation and maintenance. Many animals and birds prefer the habitat provided by the edge conditions of those two situations. Heavy timber production or development of intensive recreation development at such edge locations should be avoided. In this manner the needs of the reservation's wildlife resources will be accommodated.

FARMING AREAS

As pointed out in the Population and Economic Study, increased production of farm crops will be an important component of agricultural income gain on the Crow Reservation. Lands are designated for this activity within this Future Land Use Plan. One of the tribal goals is to share in the agricultural income growth by acquiring control of certain large farming areas on the reservation. Changes in farming patterns from a land use point of view are related to increased production, and consequently, greater farm profits will be the result of bringing more land under irrigation. The Hardin unit proposal and other irrigation developments are being formulated by local interests to accomplish this goal. During the planning period it is anticipated that some 40,948 acres of land will change from dry to irrigated farm status. Most of this change will occur in farm lands of the Hardin Bench.

Today some 41,547 acres, or 12.4 percent of land used for farm production on the reservation, is irrigated. Additions indicated in this plan will raise the irrigated acreage to 83,496 acres or 24.6 percent of total farm land. It is anticipated that the total acreage under cultivation will remain essentially constant throughout the forecast period and that irrigation will affect present dry land farms. Thus, currently unfarmed land will not be added to the farm resource.

In relation to total land on the Crow Reservation, farm land constitutes some 14.7 percent. The proposed changes in farm land status amount to only 3.3 percent of the land use change foreseen for the total reservation. Part of the farm land lies within designated flood plain management areas. Although there is no conflict in land uses for farms within this area, operators should be cognizant of flood plain potential, which may be subjected to certain land management and water pollution control measures.

NATURAL RESOURCE PRODUCTION AREAS

Economic opportunities in connection with natural resource extraction and production were identified in the Population and Economic Study. The Ecological Study identified the locations, quantities, and qualitative characteristics of these resources. Controlling use of mineral, fuel, and timber resources ultimately resides in the Crow Tribe; presently through the Bureau of Indian Affairs. Identification of land areas for use of available resources to achieve economic goals of the reservation is an important land use concern. Three classifications of natural resource production areas are included in the Future Land Use Plan for the Crow Reservation. These are:

1. The oil and gas resource production area;
2. The coal resource development and reclamation area; and

3. The forest resource production and management area.

The general use concept of these areas involves maximum production with minimum environmental impact. Therefore, production on these lands is to be coupled with the best available reclamation and management practices appropriate to each resource. Quantitatively, natural resource production areas presently include some 130,388 acres, or 5.7 percent of the reservation land area. Changes indicated for this group amount to 37.7 percent of all the reservation land use change foreseen during the planning period. By 1995 an additional 462,719 acres will be designated for extractive uses, nearly all of which will involve reservation coal resources. At the end of the planning period 593,108 acres will be included within the actual resource production designations. This amount of land equals 26.1 percent of the reservation's land area. Some overlaps in designation exist among the natural resource production uses. For example, the coal resource production and reclamation area includes some forest resource production and management area. Forest resource production and management areas also exist in highland wilderness preservation areas.

Oil and gas production designations were applied to those areas in which proven oil and gas

areas classified in this category is oil and gas wells with some 83.2 acres of land included. Although more land could probably be included in the future, locations are not known and present production areas are limited to the Soap Creek, Ash Creek, Hardin, and Lodge Grass fields.

Forest resource production and management areas include 130,305 acres or 5.7 percent of the Crow Reservation's land area. The primary activity conducted within land designated for this purpose will be logging operations. It is not anticipated that additional land will be designated for this use, therefore, it is recommended that appropriate forest management practices be employed. This is to insure that this area will experience sustained yield without resource depletion. Forest resource management practices should include a combination of timber, range, and watershed management. All timber cutting on the Crow Reservation should conform to approved working harvest plans which insure production of the same amount of timber periodically and include requirements for maintenance, productivity, and replacement of those trees harvested by natural or artificial methods. Clear cutting operations will be discouraged and any that are necessary will include reforestration. Shelter wood method cuts are preferred over clear cutting in even aged stands of timber. If economically possible, forest harvest should be by the selective method and supplemented as needed by re-seeding immediately after cutting. In the forest resource and production management areas located within highland wilderness preservation areas, only selected cutting methods will be used.

Range management must be provided in Crow Reservation forest resource and production management areas where grasslands and timber are intermixed throughout the designated area, thus requiring both forest and range mangement. Reservation forest resources are suitable for forage by domestic livestock which graze throughout the forest areas. Overgrazing in the forest resource production and management must be controlled to avoid damage to the forest resources and to the watershed areas which they influence.

In the hilly and mountainous forest resource production and management areas, watershed management must also be a concern. Objectives of this management element are to reduce surface runoff, minimize erosion, and regulate the flow of local streams. Primary to proper watershed management is the avoidance of clear cutting of large areas. Scientific investigation should be conducted in appropriate locations to determine if forest cutting would improve the regularity of water supply to serve townsites and farm irrigation needs on the reservation.

An area designated for coal resource production and reclamation at the eastern edge of the Crow Reservation will involve the most significant addition to natural resource production areas. The principal activity undertaken in this area is mining of coal supplemented by effective land reclamation activities. Currently, no land is designated for this use, although areas underlain by sub-bituminious coal and lignite ameneable to strip mining have been surveyed. Initial production of this resource is foreseen at the northern periphery of the reservation where higher grade resources have been located. The coal resource area includes land also designated for forest resource production and management, and established dry farming areas. Strip mining will not occur within one mile of any designated forest resource area during the 25 year planning period. Also, existing dry farming activities should be expected to continue within the coal resource area. A new townsite has been located at the northern edge of the coal area to house anticipated future workers involved with its extraction and production. A railroad and an improved major thoroughfare extended to the vicinity of the proposed townsite are recommended.

The coal resource production and reclamation area is planned to include 462,917 acres, or 20.4 percent of the reservation land area. Addition of this designation amounts to 37.7 percent of the land use change quantities forecasted for the reservation. This resource area contains 78.0 percent of the reservation's natural resource production land area. Influence of this designation should relate resource identification to its economic development potential, as well as specifying conditions under which the resource may be utilized. Reclamation policies should be a basic requirement for production activity.

Extraction of coal from the area will involve strip mining. This process involves removing the overburden above the coal deposit with power shovels and then extracting the coal or lignite which lie beneath it. Some coal deposits are less than thirty feet below the surface, and some are far deeper, indicating the amount of overburden movement involved in this process. Obviously, something needs to be done with the great hills and holes produced in the landscape through this process. The usual strip mining procedure is to deposit overburden in conical mounds throughout the mining area. A preferred, and recommended, method for the Crow Reservation is the dig-and-fill technique in which overburden from one site is used to fill adjacent ones in which mining has been completed. This technique should be required. The areas from which coal has been removed and then filled with overburden, are called soil banks. These are a principal problem area in strip mining.

Soil banks are generally very unevenly filled and are barren of plant life. They usually are very slow to revegetate by natural process. Reclamation processes must focus on smoothing the soil bank area and revegetating it within a relatively short period of time. This will avoid severe erosion problems, and to put the land area back into productive use. Soil banks usually are not suitable for farming becuase of abnormally excessive compaction of the disturbed earth. This renders it unsuitable for plant growth. Reclamation of soil banks on the Crow Reservation should involve reforestration where appropriate and development of grazing lands in other areas. Strictly enforced reclamation regulations should be an integral part of utilization of the Crow Reservation Coal Resource Production and Reclamation areas.

SPECIAL PRESERVATION AND MANAGEMENT AREAS

Two Special Preservation and Management Areas are proposed in the Crow Reservation Future Land Use Plan. Both of these use areas are determined by elevation. They are, a Flood-Plain Management Area at lower elevations and the highland wilderness preservation area at higher elevations. Collectively these two areas include 313,970 acres of land or about 14 percent of the reservation land area. The flood-plain area relates to the reservation's principal streams and the highland wilderness area to the mountains. Within the flood-plain area agricultural and recreational activity is encouraged and expected to take place. Within the wilderness area, it is expected that controlled forest resource production and management activity will take place as well as some limited recreational activity. Future human habitation and economic enterprise should be prohibited from both of these areas.

Within the Flood-Plain Management Area development for human habitation should be prohibited to avoid the disasterous results of periodic floods which are a serious threat to property and human lives. Uses in flood-plains should be primarily open-space uses. Zoning regulations should be prepared to designate specific and logical flood-plain uses and should provide a method by which pre-existing, non-conforming, uses can be amortized over a period of time. Reconstruction or improvement of damaged buildings within the flood-plain areas should be restricted. The zoning law should be based upon engineering studies by either the highwater unit or hydrograph method, thereby outlining precise limits of the flood plain.

Flood-Plain Management Area designations are applied to low elevation alluvial lands within the Big Horn and Little Big Horn River and Pryor Creek Valleys. Portions of most townsites lie within the areas designated. Engineering determinations should be made for each community to establish the extent of the area in dangerous location. Townsite growth recommendations in this plan place movement of new construction out of, and away from, the flood plain area.

The highland wilderness preservation areas are designated to achieve a number of goals. The Pryor and Big Horn Mountains are major identifying features of the reservation and they should be preserved as such. These upland areas also contain a major portion of the total environmental resources of the reservation. The mountains contain timber which can provide economic activity on the reservation. These resources should not be depleted for both their recreational and identity values. A large proportion of the resident Indian population hold these mountain wilderness areas in high regard and their wishes should be respected. The mountainous areas also provide habitat for many species of wildlife which should be preserved and protected. A portion of the area contains steep slopes and rocky regions that make them unsuitable for any other use. Finally, within development areas, completely wild natural resources are becoming fewer and fewer. An opportunity to maintain some on the Crow Reservation exists which makes the need to preserve the area all the more critical. Controlled forest production activity and grazing should be permitted but no new development should occur in these areas.

The designated Flood-Plain Management Area is only based on topographically aligned measurements in this plan. Using this method, an estimated 108,236 acres, or 4.7 percent of the reservaton land resource will be subject to this classification by 1995. However, a true figure may only be obtained through engineering analysis. The Preservation Area is currently described as encompassing 9,732 acres, or 0.4 percent of the reservation area. By 1995 this will increase to 205,734 acres, or 9.0 percent of the land reserve.

SUMMARY OF FUTURE LAND USE NEEDS

A summary of the anticipated future land use needs described in the preceding material is contained in Table 7. Grazing lands and rural open space will remain the largest land use throughout the forecast period. The Crow Reservation should be subject to sound land and conservation practices. Overgrazing should be eliminated by reducing the number of cattle held in problem areas. This will not necessarily mean a reduction in cattle herds as a wide variety of feed crops are suitable for full production by dry farming methods on the reservation to supplement grassland forage.

The Coal Resource Production and Reclamation Area will contain the second largest acreage. The remaining classifications in order of descending land use are: Recreation Areas, Highland Wilderness Preservation Areas, Forest Resource Production and Management Areas, and Flood-Plain Management Areas. These land uses reflect the economic development potential as identified in the Population and Economic Study, and the natural resources of the area. They should provide a usable nucleus for development of the Crow Indian Reservation.

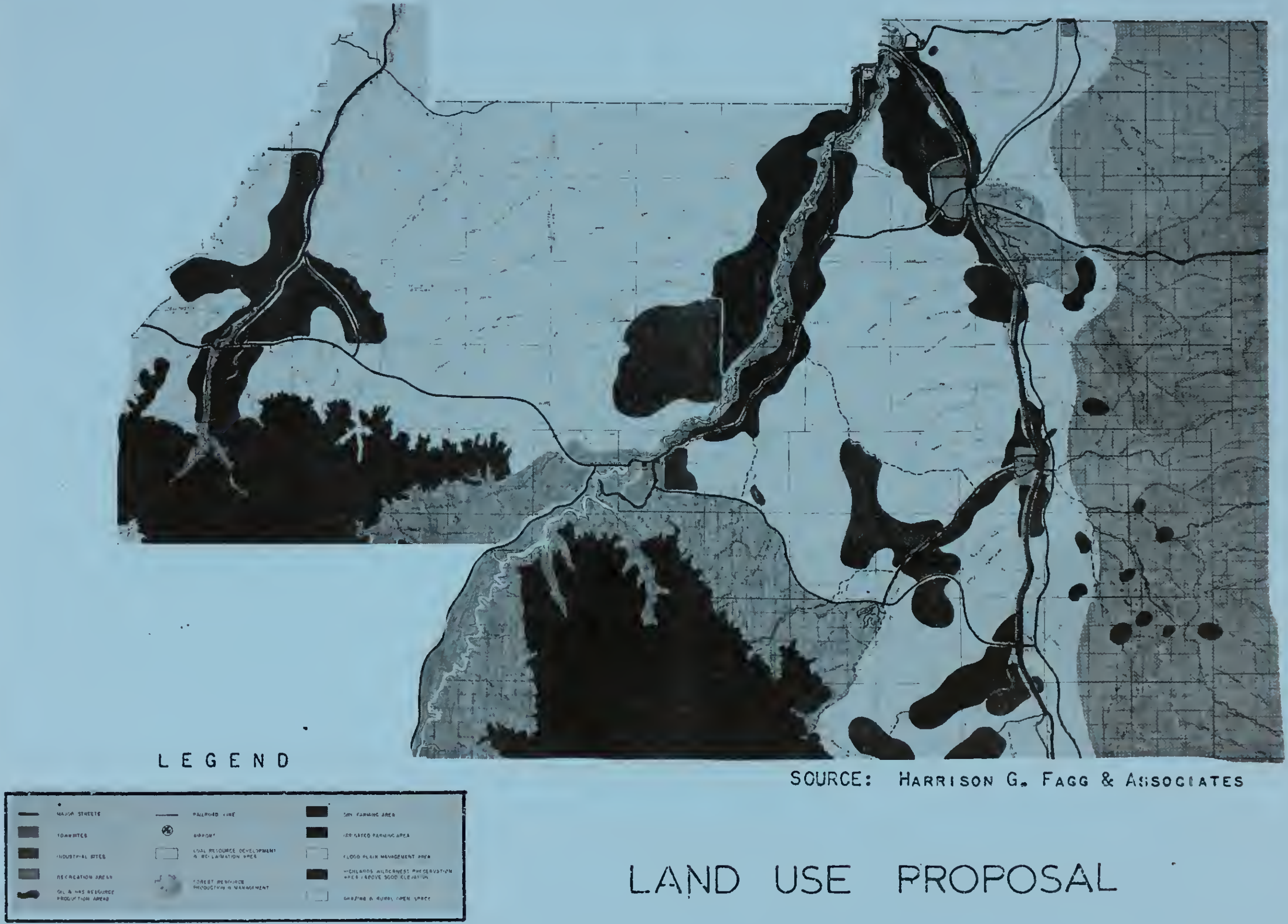
Some of the use areas overlap as previously described. This is due to the multiple-use characteristics appropriate to many rural areas.

The primary concentration of social and economic activity on the Crow Reservation will remain in the townsites. By 1990 these areas will utilize only 0.4 percent of the total land area of the reservation.

FUTURE LAND USE MAP

The Future Land Use Map generalizes the recommended design concepts as described in the preceding narrative. The map is of sufficient precision for planning purposes at this stage of the land use planning. Townsites and industrial areas are exaggerated to allow easy identification which scale reproduction would prohibit.

The alternative sketch plans were examined in detail prior to selecting one as the basis for future planning. The selected alternative rated highest in all three of the applied criteria determinations. These included time-distance of travel on the reservation, cost-benefit relationships of development, and living quality considerations to reservation residents. This is not to say the other sketches did not contain individual characteristics that had merit, as each plan was found to have singular attractive features. It may be necessary in the remaining planning activity to adjust the final land use plan to allow for desired additions, corrections, or alterations.


LEGEND
MAJOR STREETS
TOWNSITES
INDUSTRIAL SITES
RECREATION AREAS
OIL & GAS RESOURCE PRODUCTION AREAS
RAILROAD LINE
AIRPORT
COAL RESOURCE DEVELOPMENT & RECLAMATION AREA
FOREST RESOURCE PRODUCTION & MANAGEMENT
DRY FARMING AREA
IRRIGATED FARMING AREA
FLOOD PLAIN MANAGEMENT AREA
HIGHLANDS WILDERNESS PRESERVATION AREA (ABOVE 5000 ELEVATION)
GRAZING & RURAL OPEN SPACE

SOURCE: HARRISON G. FAGG & ASSOCIATES

LAND USE PROPOSAL

TABLE 7

1971-1995 LAND USE CHANGES - CROW RESERVATION

PRIMARY LAND USE CATEGORY	DESIGNATION IN ACRES		
	EXISTING USE	1971-1995 USE CHANGES	1995 DESIGN DISTRIBUTION
Reservation Townsites	399.2	+ 562.4	961.6
Recreation	765.4	+228,356.4	229,121.8
Streets and Right of Ways	8,175.2	+ 1,018.2	9,193.4
Airports	400.0	+ 200.0	600.0
Miscellaneous Public Use	1,871.5	± 0	1,871.5
Farmland	334,703.5	± 0	334,703.5
Dry-Farm	293,156.4	- 40,948.9	252,207.5
Irrigated	41,547.1	+ 40,948.9	82,496.0
Grazing and Rural Open Space	1,776,239.8	-122,201.3	1,654,038.5
Oil and Gas Resource Production	83.2	± 0	83.2
Coal Resource Development/ Reclamation	0	+462,719.9	462,719.9
Forest Resource and Management	130,305.4		130,305.4
Flood Plain Management	0	+108,236.8	108,236.8
Highlands Wilderness Preservation	9,732.5	+196,001.5	205,734.0
Water Resources	7,550.2	± 0	7,550.2
Lakes and Reservoirs	7,349.0	± 0	7,349.0
Rivers and Streams	201.2	+ 0	201.2
TOTAL RESERVATION ACRES	2,270,165.9	+874,893.9	2,270,165.9*

NOTE: Design distribution column does not add to total indicated due to multiple use of certain land categories.

SOURCE: Harrison G. Fagg and Associates.

FUTURE LAND USE POLICES

Procedural Policies for Future Land Use

1. The Crow Tribal Advisory Commission recommends that the Crow Tribal Council adopt this Future Land Use Plan for the Crow Reservation as its official policy for future land use development within the area of its jurisdiction. Its acceptance by all government authorities and private interests conducting activity within reservation boundaries is desired.

2. This Plan will constitute the basis for all public policy decisions regarding reservation development. These decisions shall include, but not be limited to, such matters as manufacturing, resource or recreational industrial development, zoning, subdivision control, housing, community facilities, utilities, street developments, community renewal and redevelopment, acquisition, disposition and use of public property, capital improvements programming and related matters.

3. The Crow Reservation's Future Land Use Plan will be dynamic and totally responsive to changing conditions and needs of the reservation. It shall be reviewed and re-evaluated periodically and at least once every five years. The Crow Tribal Advisory Commission shall continue to be responsible for monitoring changes in local economic, social, and physical conditions and making recommendations on development matters.

4. The Future Land Use Plan may be amended by the Tribal Council as it becomes necessary following recommendation by the Crow Tribal Advisory Commission in a public hearing on the proposed amendment.

5. A summary copy of the Future Land Use Plan, as adopted and subsequently amended, shall be available for public review in the Office of the Tribal Secretary.

Substantive Policies for Future Land Use

1. Human and economic values related to existing and future reservation development shall be preserved and enhanced.

2. Conflict between incompatible and unrelated land use types shall be eliminated in the future.

3. A balance between reservation development policy decisions in realistic quantities of land needed for various land use types will be encouraged.

4. The impact of human settlement and use of reservation lands upon the ecological balance of the Crow Reservation will be minimized.

5. Economy and efficiency of public improvements necessary for reservation growth and development will be realized.

6. Safe and efficient circulation of people and goods throughout the reservation will be effectuated.

7. An adequate amount of suitably located lands to accommodate a variety of residential use types will be provided.

A. Convenient locations for the development of safe, clean and healthful houses, located in pleasant surroundings and available for all Crow Reservation residents, shall be identified both within towns and in the rural areas.

B. The trend of blight and deterioration in existing residential areas will be reversed and prevented in future development.

C. The residential community will be recognized as a cohesive social, economic and physical entity containing concentrations of residential and related land uses.

D. Adequate and conveniently located community facilities and supportive non-residential land uses shall be encouraged to meet the service and social needs of each town's residents, as well as those who reside in rural areas near-by.

E. Sprawling rural development will be minimized in favor of a more cohesive pattern of settlement.

F. Reasonable, yet relatively low, density standards will be maintained, while providing opportunities for development of housing of a variety of type and in a considerable range of intensity.

G. Higher density residential development, such as multi-family housing, will be located as desired near major activity centers of each community with direct access to the principal community street system.

8. Commercial areas containing adequate amounts of properly located lands with sufficient accessibility and off-street parking, adequate utilities, good design, and visual attractiveness to accommodate a full range of commercial activities should be provided in each of the larger reservation communities.

A. It is recognized that the business area should contain concentrated activity and employment with regard to financial, administrative, governmental, and cultural activities which consequently contribute support to retail trade and service enterprises. Such centraliza-

TION WILL BE STRENGTHENED IN THE LARGER RESERVATION TOWNS.

B. COMMERCIAL DEVELOPMENT CLUSTERS CONTAINING PRIMARILY RETAIL ACTIVITY ARE CURRENTLY PROVIDED AT VARIOUS RESERVATION LOCATIONS. CONCENTRATION IN THESE CENTRALIZED ACTIVITY CENTERS IN SIZE AND LOCATION SHOULD CLOSELY RELATE TO POPULATION AND POTENTIAL TOURIST TRADE NEEDS. THIS PATTERN SHOULD BE CONTINUED, ESPECIALLY IN RESERVATION RECREATION AREAS.

C. ADEQUATE AMOUNTS OF LAND LOCATED IN CLOSE PROXIMITY TO ALL MODES OF TRANSPORTATION WILL BE DESIGNATED FOR THE DEVELOPMENT OF DISTRIBUTION ACTIVITIES.

D. RETAIL SHOPPING CENTERS OF THE COMMUNITY TYPE WILL BE CONVENIENTLY ACCESSIBLE TO RESERVATION RESIDENTS IN THE LARGER COMMUNITIES. SUCH CENTERS SHALL BE LOCATED AND DESIGNED SO AS TO CONTRIBUTE TO THE IDENTITY OF COMMUNITIES IN WHICH THEY ARE LOCATED.

E. THE DEVELOPMENT OF SPOT COMMERCIAL LOCATIONS AND STRIP COMMERCIAL DEVELOPMENT ALONG MAJOR RESERVATION STREETS WILL BE DISCOURAGED IN FAVOR OF CLUSTERING COMMERCIAL ESTABLISHMENTS IN COHESIVE UNITS WITHIN TOWNSITES AND IN SELECTED RECREATION AREA LOCATIONS.

9. A SUFFICIENT AMOUNT OF LAND WILL BE DESIGNATED FOR REALIZATION OF THE CROW RESERVATION'S INDUSTRIAL POTENTIAL AND ACHIEVEMENT OF ITS INDUSTRIAL DEVELOPMENT GOALS.

A. INDUSTRIAL SITES WILL PROVIDE FOR GROUPING INDUSTRIAL ACTIVITIES IN A VARIETY OF LOCATIONS THROUGHOUT THE RESERVATION, YET WILL AVOID SCATTERED FREE-STANDING INDUSTRIAL DEVELOPMENT.

B. LAND DESIGNATED FOR INDUSTRIAL USE WILL BE READILY ACCESSIBLE TO VARIOUS MODES OF TRANSPORTATION AND THE RESERVATION'S MAJOR STREET SYSTEMS. THIS LAND WILL BE ADEQUATELY SERVED BY PUBLIC UTILITIES AND WILL BE SEPARATE FROM BUT ACCESSIBLE TO RESIDENCES OF THE LABOR FORCE.

C. INDUSTRIAL AREAS WILL BE PROTECTED FROM PREEMPTION AND ENCROACHMENT BY RESIDENTIAL DEVELOPMENT.

D. INDUSTRY LOCATING ON THE CROW RESERVATION WILL CONFORM TO LOCALLY ACCEPTED PERFORMANCE STANDARDS.

10. ADEQUATE AMOUNTS OF WELL LOCATED LAND WILL BE PROVIDED AND RESERVED TO ACCOMMODATE, EXPAND, AND IMPROVE THE PUBLIC AND SEMI-PUBLIC FACILITIES NEEDED BY

A GROWING RESERVATION POPULATION.

A. ADVANCE SITE DESIGNATION FOR PUBLIC FACILITIES WILL BECOME AN ONGOING PROGRAM OF THE CROW TRIBAL ADVISORY COMMISSION IN ORDER TO INSURE THAT INFORMED FORETHOUGHT AND COORDINATION ARE INCLUDED IN LOCATING FACILITIES ADEQUATE TO SERVE THE RESIDENT POPULATION.

B. PUBLIC FACILITIES WILL BE LOCATED AND DESIGNATED SO AS TO CONTRIBUTE TO THE IDENTITY OF THE COMMUNITY WHICH THEY SERVICE.

C. EACH RESERVATION COMMUNITY SHALL CONTAIN LAND DEVELOPED AS PARKS IN AN AMOUNT ADEQUATE TO MEET THE NEEDS OF THE RESIDENTS.

D. SITES WILL BE IDENTIFIED FOR A FULL RANGE OF FACILITIES TO SERVE THE EDUCATIONAL NEEDS OF EACH RESERVATION COMMUNITY. THESE SITES WILL CONTAIN ADEQUATE OFF-STREET PARKING AND BE RELATIVELY FREE FROM SUCH DISTURBING EXTERNAL INFLUENCES AS HEAVY TRAFFIC AND EXCESSIVE NOISE.

E. THE SCHOOL SITES WILL BE LOCATED SO AS TO PERMIT SAFE DIRECT ACCESS TO THE MAJORITY OF THE ATTENDING STUDENTS AND WILL BE LARGE ENOUGH TO PROVIDE SPACE FOR PLAYGROUNDS THAT SERVICE SURROUNDING NEIGHBORHOODS. SCHOOLS NEED NOT BE SURROUNDED BY VEHICULAR TRAFFIC STREETS.

F. LOCATION OF BUILDINGS IN WHICH PUBLIC SERVICES ARE OFFERED SHALL BE DETERMINED SO AS TO PROVIDE THE OPTIMUM DEGREE OF CONVENIENCE IN MEETING THE SERVICE, CULTURAL, EDUCATIONAL, INFORMATIONAL, AND RECREATIONAL NEEDS OF THE PUBLIC. SITES FOR SUCH BUILDINGS WILL CONTAIN ADEQUATE OFF-STREET PARKING SPACE.

G. CHURCH SITES, LARGE ENOUGH TO PROVIDE ADEQUATE ACTIVITY AND PARKING SPACE, WILL BE LOCATED SO AS TO BE CONVENIENT FOR EVERY CITIZEN TO PRACTICE THE FAITH OF HIS CHOICE.

H. ADMINISTRATIVE BUILDINGS FOR USE BY FEDERAL, STATE, AND LOCAL GOVERNMENTS, AS WELL AS HOSPITAL, CULTURAL FACILITIES, AND OTHER INSTITUTIONAL USES, WILL BE CENTRALLY LOCATED TO SERVE THE ENTIRE RESERVATION AND WILL INCLUDE ADEQUATE OFF-STREET PARKING AREAS.

I. AN AIRPORT WILL BE DEVELOPED AT CROW AGENCY TO PROVIDE FOR THE NEEDS OF ALL TYPES OF INTERMEDIATE SIZED, MODERN PASSENGER AND FREIGHT EQUIPMENT AND WILL INVOLVE JOINT USE OF AIRPORT PROPERTY TO SERVE THE NEEDS OF THE RESERVATION INDUSTRIAL, RECREATIONAL, AND DISTRIBUTION ACTIVITIES.

J. Sites of historic significance will be identified for public and private preservation.

11. Adequate amounts of suitably situated land will be designated for park, recreation, and open space use to enhance the economical, cultural, and physical enrichment of the Crow Reservation's residents. Such land will contain a variety of recreational opportunities readily accessible to residents and tourists alike. This space will contribute, through its location and design, to the identity of the community which it serves. Appropriate recreational designated land will be set aside to contain landmarks and areas of historic significance.

A. Designation of extensive unique areas for recreational purposes is essential to realization of this principal economic reservation goal. Strict control of such areas as those surrounding the Big Horn Canyon National Recreation Area will be exercised in order to preserve and enhance Indian values, as well as the scenic grandeur and quality recreation development in this portion of the reservation.

B. All reservation land with an elevation in excess of 5,000 feet shall be included in a highland wilderness preservation area which is so designated to preserve the natural environment of the reservation's mountain areas. The only productive activities permitted within these highland wilderness preservation areas are well managed timber resource production and limited recreation activities.

C. Open space preservation areas are recognized as an essential public use and an integral part of the Crow Reservation's environmental character.

D. Identification and preservation of a reservation-wide system of open spaces is recognized as a desirable objective. Such a system should extend through the reservation the full length of the Big Horn River.

E. Flood plain areas throughout the Crow Reservation, including those of the Big Horn and Little Big Horn Rivers, shall not be developed with structures of permanent human habitation. Utilization of such areas for permanent open space reserves is a desirable alternative. Development which has already taken place in these flood plains shall be permitted to continue, but additional development, especially in reservation communities, shall be limited to established townsites.

12. Recognizing its economic importance to the welfare of the Crow Reservation, continuing attention will be focussed upon improving the quality of management of agricultural lands. Efforts will continue to realize development of the Hardin unit and other irrigation proposals to bring increased reservation acreage under more productive irrigated operations. Tribal efforts to acquire consolidation of farm holdings for tribal operations are encouraged. Raising of feed crops on marginally productive lands is suggested to help overcome potential overgrazing.

13. All extractive operations on the Crow Reservation will strictly adhere to state and federal required and recommended land reclamation practices. All mining permit holders will agree, in writing, to the reservation's reclamation policies and shall annually submit evidence of such compliance.

14. All lumbering operations on the Crow Reservation will conform to recommended forest resource management and land reclamation practices of the U. S. Forest Service. Forest resource producers will obtain a permit to operate on the Crow Reservation. As a condition to this permit, they will be required to agree, in writing, to the reservation's reclamation and management requirements and will annually submit evidence of compliance.

IMPLEMENTATION

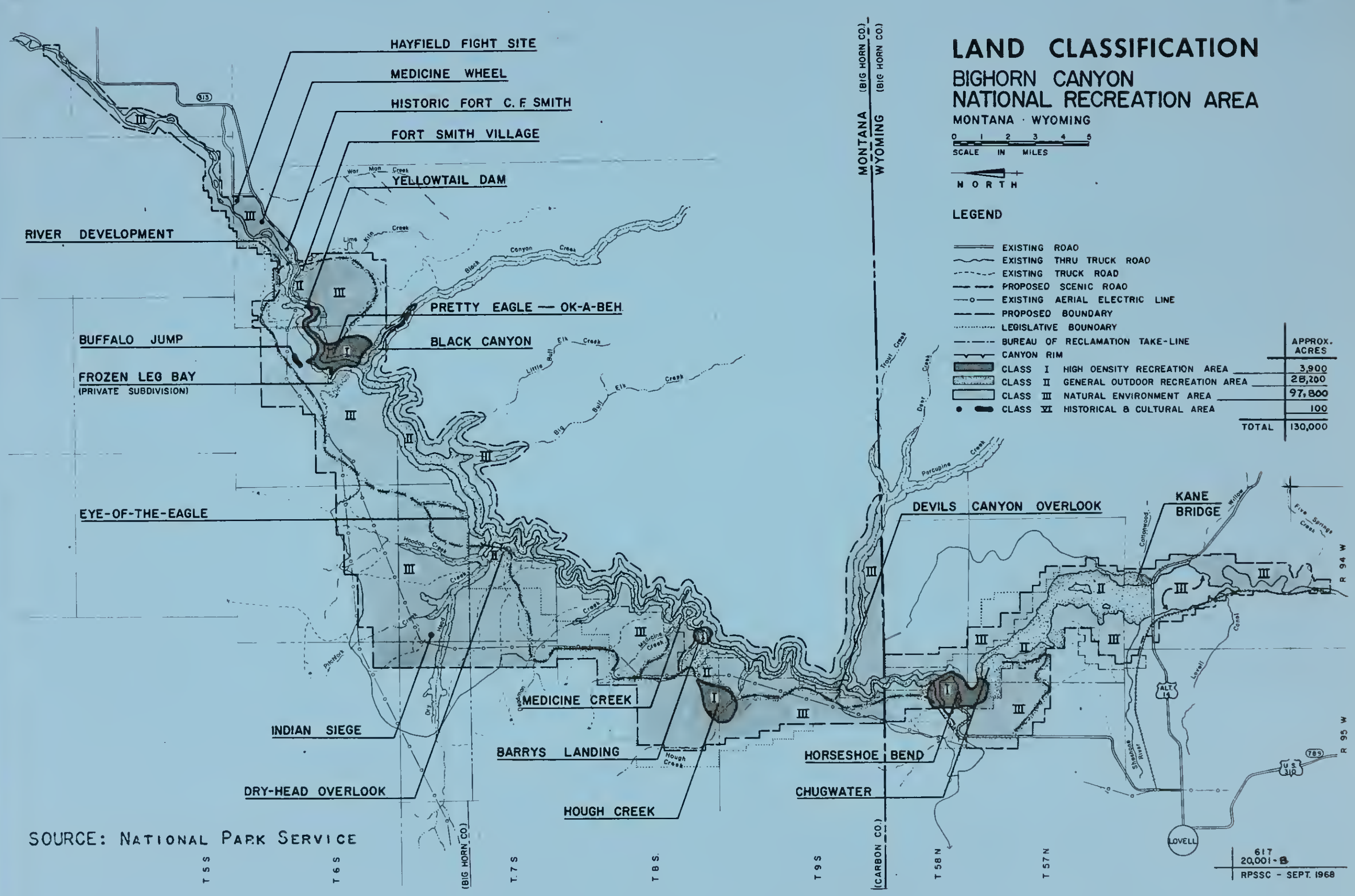
Several tools are necessary to guide future land use development on the Crow Reservation. Some of them proceed directly from this Future Land Use Plan and the policies and maps which make it up. Others relate indirectly but should be coordinated if a concentrated effort plan implementation is to be accomplished. Five major techniques to regulate, direct, and otherwise influence growth are recommended as a system to guide the Crow Reservation's development. These five techniques are:

1. A comprehensive plan;
2. Coordinated reservation development policies;
3. A public works development plan;
4. A comprehensive reservation development code; and
5. An informed citizenry.

Much of the positive benefits to be realized from utilization of these five implementation techniques will depend upon how well coordinated they are. Each of them should be reviewed as a part of the total implementation system which

LAND CLASSIFICATION

BIGHORN CANYON
NATIONAL RECREATION AREA
MONTANA · WYOMING



LEGEND

		APPROX. ACRES
EXISTING ROAD		
EXISTING THRU TRUCK ROAD		
EXISTING TRUCK ROAD		
PROPOSED SCENIC ROAD		
EXISTING AERIAL ELECTRIC LINE		
PROPOSED BOUNDARY		
LEGISLATIVE BOUNDARY		
BUREAU OF RECLAMATION TAKE-LINE		
CANYON RIM		
CLASS I	HIGH DENSITY RECREATION AREA	3,900
CLASS II	GENERAL OUTDOOR RECREATION AREA	28,200
CLASS III	NATURAL ENVIRONMENT AREA	97,800
CLASS VI	HISTORICAL & CULTURAL AREA	100
	TOTAL	130,000

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20,001-B
RPSSC - SEPT. 1968

SOURCE: NATIONAL PARK SERVICE

draws upon the comprehensive plan of which this Future Land Use Plan is a major element. In serving as an organizing force, the plan should provide a key technique for guiding both public and private actions to produce the desired development patterns. At the same time, the coordinated reservation development policies specify the conditions under which public services will be extended and the public works development plan sets forth a schedule for construction of public facilities needed to provide such services. Collectively, these tools formalize action by the public sector. While this is happening, the recommended comprehensive development code and the civic education program become key techniques for regulating and insuring more informed action in the private sector. These recommended implementation tools are heavily inter-related. If they are to achieve their potential, their relationship must be recognized and given constant direction through one coordinated framework.

Comprehensive Plan

The comprehensive plan for the Crow Reservation should provide a unified physical design which reflects changing population and economic needs. The plan will include elements of economic and social development, land use, circulation, and community facilities, along with several others. To be effective in guiding development, the comprehensive plan must relate closely to tribal decision making. The process of planning should be intimately involved with decisions made by local officials which relate to reservation development. Too often local government takes actions or enacts laws without first preparing an overall plan to guide them.

Fundamental requirements for realizing full effect of the comprehensive plan are recognized. Imaginativeness in a plan is necessary if it is to have the power to inspire much support. It must be technically practical and capable of inspiring confidence. The plan and the reservation planning process must be in the mainstream of tribal decision making. In being imaginative, the comprehensive plan can successfully deal with improving the living quality of the reservation. However, the plan must go further than just a written report or a policy statement. It must go to a detail evaluation of individual development proposals in light of the plan. A practical plan contains feasible and competent proposals. Such feasibility is measured in terms of financial reasonableness, sensitivity to human aspirations, and local political factors. While cost-benefit analysis is useful

In evaluating this, the plan's competance should also be judged by the extent to which it considers the inter-relationship among significant factors which influence development of the reservation. The comprehensive plan should be kept up-to-date and expanded as time goes on. Annual evaluation of decisions made toward this realization can provide a measure of its successfulness as a guide to development.

Coordinated Reservation Development Policies

A usable and inter-related set of public policies to guide reservation development are recommended. These policies should serve as a consciously derived guide for the use by local officials in achieving consistency of action in the pursuit of predetermined purposes and administration of particular responsibilities. Many of the tribal government's day to day actions have significant impact upon reservation development. The potentiality for utilization of public policy as an instrument for guiding environmental change is most useful. The cumulative effect that consistency of action by numerous participants can have on reservation development is significant.

Consistency of action in public policies necessitates their coordination. When policies are reviewed in light of avowed objectives by a responsibile body, there is a likelihood for deliverate coordination. The further responsible administration is removed from the point of application, the less likely it is that policies relating to change will be coordinated. The effectiveness of policies as a means of guiding reservation development is dependent upon whether relevant policies are contained in a coordinated framework. This framework should be utilized as a basis of coordinated action by all applicable local agencies involved in decision making and administration of local problems related to reservation development. This recommended coordination of development policies involves both its formation and its utilization to accomplish sound physical results and an improved pattern of growth. Local policies related to reservation development should be written in a single document to be effectively utilized. The statement should be sufficiently concrete, acceptable, and non-conflicting to be adopted collectively by resolution. Ultimately, adoption of a formal written development policy statement for the Crow Reservation would be desirable.

The exact contents of the proposed local development policy statement should reflect the comprehensive plan, reservation goals, objectives, and standards, proposals established for realizing them, and the timing of their implementation.

This policy coordination can bring together relevant existing policies, identify desired new ones, and tie the new and old together. The potential for this recommended plan implementation tool is significant to realization of the Crow Reservation's Comprehensive Plan.

Public Works Development Plan

The third major tool for implementing plans for the future development within the Crow Reservation involves a public works development plan. It should follow coordination of development policies which establishes conditions under which public facilities and services will be established. The public works development plan constitutes a means of following through once a policy has been adopted. It identifies specific improvements for specific locations and establishes priorities for their development. If local day to day decisions can be realted to the proposed policy coordination, a dynamic public works development plan related to the comprehensive plan and attuned to the coordinated policies can exert strong influence upon reservation development. Such a dynamic plan should be annually reviewed and adapted by tribal authorities.

Three significant areas of coordination need to be recognized in a successful public works development plan. They are:

1. Coordination among the functional elements of the tribal government's overall program.
2. Coordination of programming between the tribal government and the several other governmental agencies which serve the Crow Reservation.
3. Optimization and coordination in the use of federal and state assisted programs towards achievement of local ones.

A public works development plan provides an important link between planning and the decision making process. Annual review of scheduling and funding of public improvements provides a means of influencing the location, timing, and intensity of development within the reservation. If properly coordinated and utilized, this tool can have a considerable cumulative effect in channeling growth to particular areas and influencing the character of such development. The combining of functional project types in the area when timed in harmony with other techniques to shape reservation growth will insure efficiency in public works installation, provision of services, and total reservation development.

Comprehensive Reservation Development Codes

Control of reservation development by regulation has been ineffectively utilized on the Crow Reservation. Regulatory tools can accomplish only part of the job of plan implementation, but a part, however, which is very important. It is recommended that such ordinances as zoning, subdivision control, building, housing, fire protection, and other similar local laws be developed, linked together, and organized into a unified comprehensive reservation development code.

Such a code would reorganize and codify in one ordinance all of the various and applicable regulations contained in several different ordinances. If the comprehensive plan and its several elements are to become an effective consideration, an orderly, simplified, and unified development code is essential. Too frequently a comprehensive plan is rendered useless by the profusion of regulatory measures and their diverse administration. Simplification is necessary to make regulatory requirements intelligible to the public and their administration by local officials possible. In codifying applicable laws, parts of ordinances dealing with similar matters should be brought together and conflicts between existing laws and those proposed should be resolved.

The recommended comprehensive development code should be designed as a positive influence upon physical change as well as providing for coordination of specifications. Some type of performance criteria should be initiated to determine the effectiveness of this regulatory technique. Two significant elements of the recommended comprehensive reservation development code deserve recognition at this point because of their importance to the future land use plan. These elements are the zoning ordinance and subdivision regulations which will be developed in the subsequent phase of this planning program. Usable and contemporary laws of this nature are essential to realization of the objectives of the Future Land Use Plan. It should rate very high in priority for local action.

Citizen Information & Participation

The final element of plan implementation must rely upon the pursuasive power of a sound and logical approach to reservation growth and development. A broad and continuing program of civic education will help the Crow Reservation residents see the wisdom of planned growth. Such a direct appeal can be built upon the concept of keeping the public informed about the reservation's comprehensive plan and of achieving reservation goals and objectives through the cumulative effect of general adherence to sound principals through consistent action and with application of adequate standards for land development.

A broadly conceived and continuing program of civic education will exert some influence on development decisions of both the public and private sector. Four complementary areas of emphasis are recognized as desirable. The first involves a carefully prepared continuing program of public information reporting on problems and needs and the steps necessary to meet them as they arrive. The second element utilizes the principal of participation to inform individuals and groups. Citizens and technical advisory committees assist in guiding local actions through developing a sense of civic responsibility. The third element of civic education utilizes demonstration, showing how private efforts can be related to public action for improvement. Finally, the participation of school children can help develop interest and awareness of local problems and their solutions and will be of long term benefit to the entire reservation.

To achieve maximum effectiveness in the use of these four civic education devices, a general long-range civic education program should be organized in tome with close relationship to other implementation techniques recommended for the Crow Reservation's comprehensive plan.

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harrison g. fagg & associates crow tribal advisory commission